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MAR 81 G JEANE

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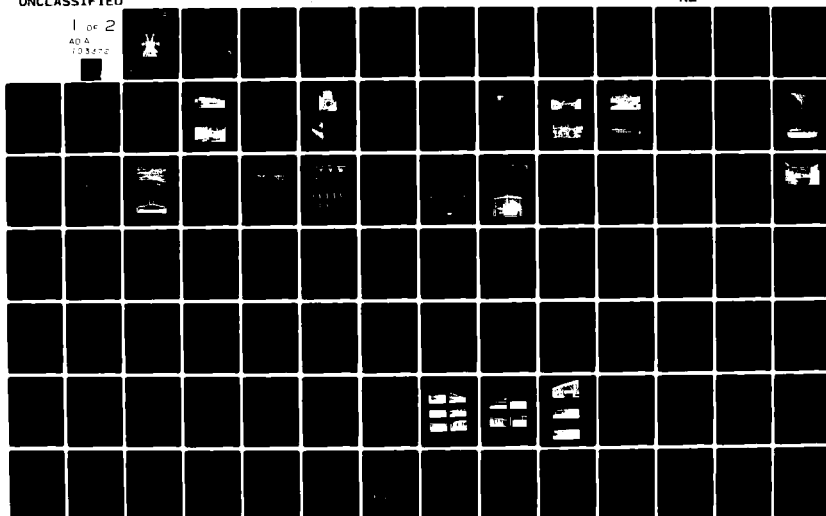
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**Inventory and Evaluation of  
Engineering Cultural Resources:  
Montgomery to Gadsden, Alabama  
Coosa River, Alabama**



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Prepared for the  
U.S. Army, Corps of Engineers  
Mobile District  
Mobile, Alabama

By

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Department of Geography  
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March, 1981

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Industrial archaeology has achieved a respectable following among scholars and amateurs in the United States in a relatively short time. It is encouraging that governmental agencies at various levels, from state to federal, have developed some sensitivity toward cataloging and assessing our industrial heritage. Because much of the methodology behind industrial archaeology is imperfectly worked out, confusing, or at least misunderstanding has developed concerning the proper method of analyzation and evaluation of historic engineering structures and industrial material culture.

It is the responsibility of the US Army Corps of Engineers, under Public Laws 89-665, 81-190, 93-291, Executive Order 11593 and the Corps Regulation ER 1105-2-460 and their amendments to survey, assess, and protect cultural resources within its jurisdiction. This report focuses in particular upon the railroad and highway bridges across the Coosa River from Montgomery to Gadsden, Alabama.

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Prepared for the  
U. S. Army, Corps of Engineers  
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Mobile, Alabama

By  
D. Gregory Jeane, Ph. D.  
Department of Geography  
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Auburn, Alabama

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#### ACKNOWLEDGEMENT

The history of bridge development is a complex topic spanning the centuries from Roman times to the present. Data have been drawn from primary and secondary works, primarily from the nineteenth century. The library at the Alabama Department of Highways, the Ralph Brown Draughon Library at Auburn University, the Georgia Institute of Technology Library, and the Georgia State University Library, and the Department of Archives and History in Montgomery, Alabama, all yielded essential materials.

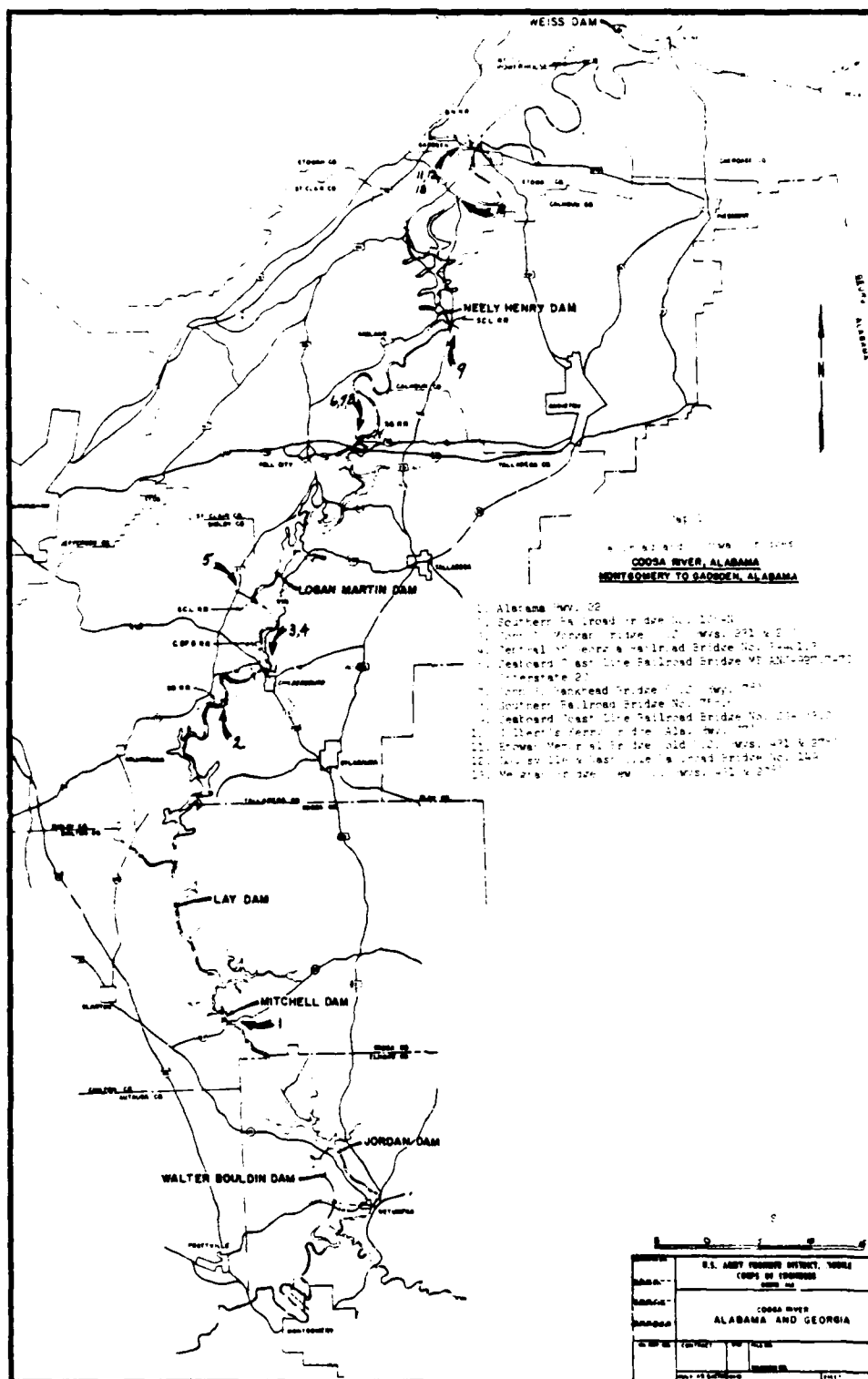
A number people were helpful in securing materials from various sources. I wish to thank the staff in general of the Ralph Brown Draughon Library at Auburn University. In particular, Dr. Ruth Fourier, Glen Anderson, and Gene Geiger gave unselfishly of their time. Mrs. Billie Ritchie of the state highway department's library was gracious and cooperative in helping me to find information. My thanks to Mrs. Mike Tidwell for typing assistance and to Mrs. Jeanne Dean for typing the final draft. Lastly, my thanks go to my wife Karen for her patience, fortitude, and professional assistance; her encouragement and support remain my bulwark.

*D. Gregory Leane*

## INTRODUCTION

Industrial archeology has achieved a respectable following among scholars and amateurs in the United States in a relatively short time. It is encouraging that governmental agencies at various levels, from state to federal, have developed some sensitivity toward cataloging and assessing our industrial heritage. Because much of the methodology behind industrial archeology is imperfectly worked out, confusion, or at least misunderstanding, has developed concerning the proper method of analyzation and evaluation of historic engineering structures and industrial material culture.

It is the responsibility of the U. S. Army, Corps of Engineers, under Public Laws 89-665, 91-190, 93-291, Executive Order 11593 and the Corps regulation ER 1105-2-460 and their amendments to survey, assess, and protect cultural resources within its jurisdiction. This report focuses in particular upon the railroad and highway bridges across the Coosa River from Montgomery to Gadsden (Map 1). Of more than passing concern is the assumption by the major federal agencies responsible for cataloging and protecting our national heritage, namely the Historic America Engineering Record and the National Register of Historic Places, that a structure fifty years or older and still in situ is potentially eligible for nomination. This is vague and conceivably could increase the government's work load to evaluate and make decisions about the importance of a nomination, thereby being inefficient because of too many non-eligible submissions. The regulatory agencies are reasonably explicit about the information they need or desire once a site or structure has been determined valuable. There is not much, however, to assist the field investigator in making a preliminary evaluation as to whether a particular object should even be nominated. It is the intent of this report to not only evaluate the bridges on this particular stretch of the Coosa, but to suggest some additional steps that would assist in the preliminary reconnaissance of the bridges, in this instance, to determine if it is necessary



for further follow-up. It is hoped this will be viewed as a positive aid to the state agency.

Using those criteria already established by governmental agencies, the following procedure is offered as a refinement in the evaluation process of industrial archeology sites or artifacts:

1. Before commencing field work, the investigator should contact some, or all, of the following data bases for relevant information concerning local history, bridge plans, engineering specification, and the like:
  - a. State Historic Preservation Offices
  - b. State Archivist
  - c. state highway commission
  - d. local planning commissions
  - e. state and local historical societies
  - f. knowledgeable historians
2. The actual bridge site should be analyzed stressing not only the integrity of the site but pursuing sound assessment of the changes or modifications of the site. Has it, for example, been significantly altered, moved, or improved upon? Were there other activities associated with the site?
3. The bridge situation should be investigated. This will indicate the position of the bridge in a larger transportation scheme or network. In addition some indication of the influence of the bridge site upon the development of local routes might develop.
4. Analysis of the function of the bridge would be required. Above and beyond the obvious use, some assessment of purpose would be helpful. Did it, for example, originate as an industrial spur and later become incorporated into a larger network? Was its primary function intended for passenger or industrial business?
5. It will be necessary to reconstruct a history of the bridge site to include its date of construction, the builder and engineer (if known), and the association with people and events of a historic nature.
6. Lastly, the technical aspects of the structure can be dealt with (Such items as the length, number of spans, piers, abutments, and the like).

Once an investigator has done his homework with local regulatory agencies and authorities, analyzed the bridge site, assessed the bridge situation, investigated its function, reconstructed a brief history,

and dealt with the technical components of the bridge's construction, then he is in a position to be of some real value to higher regulatory authorities by submitting intelligent recommendations for further investigation. The perceived objective would be to decrease the case load, so to speak, of these agencies by effectively screening artifacts before they get so far along in the evaluation process. In this manner the process might become more efficient and less costly to the taxpayer.

The manuscript has been developed along the following lines: chapter one, a brief history of the bridge as a cultural artifact. Emphasis will be upon the continuum of type development and, insofar as possible, the process by which bridgeheads are selected. The second chapter will emphasize the historical geography of the local transportation network in the Coosa Valley. It should be noted that information of a useful nature was difficult to come by for most of the railroads. Because of the particular organization of rail companies, most without adequate avenues for communication with the general public, data provided was sketchy and disappointing. Consequently, an adequate assessment of the impact of railroads on bridge building is necessarily weak. The third chapter contains an analysis of each bridge across the Coosa within the prescribed study area and an assessment of its eligibility for nomination to the National Register of Historic Places. A selected, annotated bibliography, a glossary, and assorted appendices are included.

## Chapter 1

### A BRIEF CULTURE HISTORY OF THE BRIDGE

The bridge as a material artifact spans the total length of civilized time. Complexity and design have run the gamut from the simplistic use of fallen trees across streams to complex steel structures spanning vast stretches of water. Bridges are more, however, than a mere means of crossing an obstruction in man's path. The development of bridges, as nicely or perhaps more so than many phenomena, typifies technological and cultural progress.

The origin of the first bridge lies obscured in the ancient past. It is commonly held by engineers and scientists of many backgrounds, however, that the bridge represents the oldest engineering work by man. Since earliest times man has had to deal with the necessity of crossing streams, rivers, bays, canyons, and other natural obstructions in his desire to move from one area to another for whatever reasons. What is intriguing is the way human groups all over the world have dealt with such problems. The experimentation with bridges in the pre-technical recesses of our existence unknowingly, apparently, touched upon the basic principles that led to the development of the arch, cantilevering, and suspension as primary modes of bridge construction. Suspension bridges (Fig. 1) are known to have been used from very early times in South America and India (Robins, 1948:82-93); ancient China knew the technique of the cantilever (Gies, 1963:1-2) (Fig. 2). These early bridges, however sophisticated they were for the times, were of diminished value because of man's limited technology. As man progressed, however, the invention of the wheel, the expansion of trade and the ever increasing road network of the ancient world, the rise of urbanism, and mercantilism in general brought the problem of river crossing constantly to the forefront of society's thinking. If the engineering history of the bridge can be likened to a tree with its various branches, then the





BRIDGE MADE OF WIDE LOGS OVER THE RIVER MAYPO IN CHILE.

Fig. 1



Fig. 2

roots must be the early experimentations of ancient man using the elementary principles of the beam, the arch, and suspension, for every bridge design is based on one or more of these principles (Whitney, 1929:24).

It is of more than passing interest to note that bridge construction was primarily the bailiwick of the architect for centuries before the development of engineering as a profession. Early architects were as concerned about the aesthetic aspect of bridge building as much as they were the structural one. The first great age of bridge building was, not surprisingly, Roman. The Roman architect Vitruvius in his ten books on architecture sought to establish the concept of accurate relationships between buildings and their surroundings. Likewise Palladio, in the sixteenth century, was of the same mind when he stated the opinion that bridges, like other structures, ought to be judged on convenience, beauty, and durability (Whitney, 1929:27). Let us begin this sojourn into the culture history of the bridge with the Romans, a group whose cultural legacy exhibits their propensity for engineering genius.

#### ROMAN INGENUITY

The oldest bridges to survive from ancient times to the present are those built by Romans. From this period we can establish, for the civilized Western world, a semblance of the progression of bridge technology. Bridge building in the Roman cultural arena began some 300 years before Christ and continued until some 200 years after His death. During this time span the Romans produced bridges of construction technique and design that have never been surpassed.

The building form par excellent of the Roman engineer was the arch (Fig. 3). Where the knowledge of the arch developed simply is not known but it appears that the first architects to come to Rome brought the concept with them from Etruria, an important hearth area for Roman culture in west central Italy near the present states of Tuscany and Umbria.

The construction of a bridge in ancient times, in all times really, posed some difficult questions. What, for example, would form the foundation of the pier? How could materials be secured under water? How would the pier, once built, be protected from scour? The Romans solved all of these problems with the use of the arch. The only arch form



Fig. 3

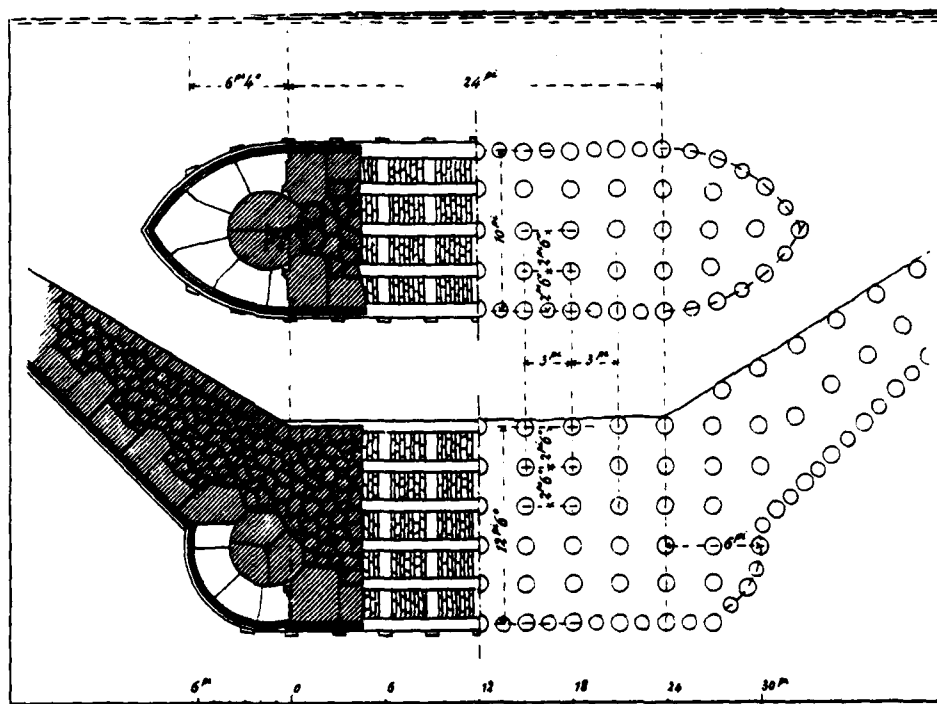


Fig. 4

known to them was the semi-circle, a type which rests half of its weight on each of two piers. The Romans built the abutments first and then one pier at a time connecting one arch at a time.

What then was the procedure employed to span a river? Bridge construction generally progressed through the summer and fall and was allowed to stand incomplete through the winter and spring. The unique Mediterranean climate was particularly suitable for this schedule as the prolonged drought of summer, extending well into the fall, meant that river levels would be at their lowest and thus maximum efficiency could be obtained from labor expended. Characteristic of arid environments, the heavy winter and spring rains turned near dry riverbeds into raging torrents that often rampaged out of control causing extensive flooding and widespread damage.

Bridges were often not uniform in size. For example, the longer the arch span, the thicker the pier had to be to support the weight. Over the center of a river, boat traffic and a more rapid current might suggest a series of arches needed to be wider than those closer to shore. In addition, the imperfectly devised cofferdam meant that Roman engineers had to rely on the riverbed itself to provide a firm foundation, thus uneven spacing of piers and varying pier thickness. Roman arches were usually fifty to ninety feet in span; piers were from eighteen to thirty-six feet thick (Gies, 1963:8).

The initial step was to provide a secure foundation for the pier. They devised a system of driving wooden pilings deep into the river bed. To accomplish this the Romans devised the technique of the cofferdam. Imperfect as it was, consisting of a double circle of pilings with clay dumped in between, it allowed laborers to sink pilings deeper than would have been possible otherwise. Pilings were driven by a machine invented for the purpose, initially a stone weight dropped from some height. Pilings were generally alder, oak, or olive; charring before driving added strength to the timber. Driven as close together as possible, the interstices were filled with stones and mortar (Fig. 4). The Romans discovered that pozzolana, a volcanic clay from the vicinity of Naples, produced an excellent mortar unaffected by water (Gies, 1963:9).

To protect the piers against scouring, washing out of the pier by the current, Roman engineers shaped the pier fronts into a prow, pointed

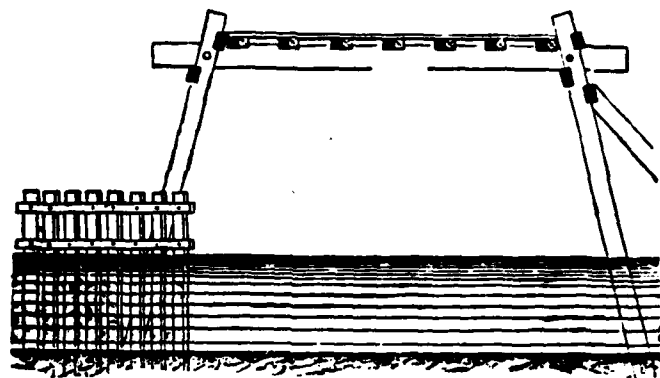
into the current (Fig. 5). Later these were modified to point at both the upstream and downstream sides of piers. Once the piers were in position it was necessary to connect the arches. A frame work of wood, supported partly on each end by the piers and partly in the center by temporary pilings (Fig. 6), would be constructed upon which the wedge-shaped stones, called voissoirs, were placed. The voissoirs were often of travertine while the inner core of the arch would be volcanic tufa. Voissoirs would be placed in overlapping rows for maximum stability.

The earliest Roman bridges were wooden and no evidence or records of them remain. The oldest known bridge is the wooden Pons Sublicus which was built between 640 and 616 B.C. (Fig. 7). The oldest stone bridge still standing is the Pons Senatorius (Fig. 8) built across the Tiber in 181 B.C. One of the most beautiful of Roman bridges is the Pons Augustus at Rimini which was constructed about 20 B.C. (Fig. 9).

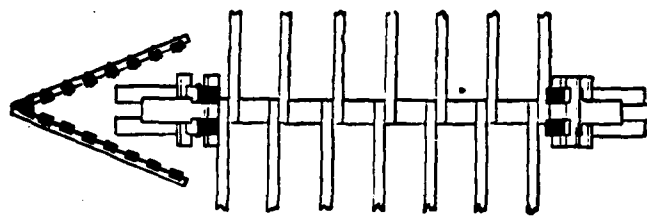
The strength of the Roman Empire was dependent upon the rapid deployment of troops to the farthest reaches of the land. Consequently, the Roman transportation system was particularly well designed. Numerous bridges were, of course, constructed; the finest examples outside of Italy are found in France and Spain. In addition to bridges, there are excellent remnants of aqueducts, the most famous being the Pont du Gard near Nimes, France (Fig. 10). Typical of the times, many of these bridges and aqueducts are built without mortar. The survival of so many Roman bridges across the face of Europe is testimony to the consummate workmanship of the stone masons as much as the architects/engineers who designed and directed the works. Symbolic of the strength and power of the Empire, bridge work went into decline in the 2nd century A.D. along with the demise of the Roman government. The fall of the Roman Empire in 395 A.D. saw the end of significant bridge building for nearly 700 years (Whitney, 1929:80; Gies, 1963:19). Bridge technology slipped into dormancy in Europe while at the same time Asian bridge building came into ascendancy, albeit utilizing a different structural concept.

#### THE ASIAN INTERLUDE

The stone arch apparently was diffused into Asia from the periphery of the Roman Empire. It was carried into the heart of dynastic China



Cross Section at Pier.



Plan at Pier.

Fig. 5

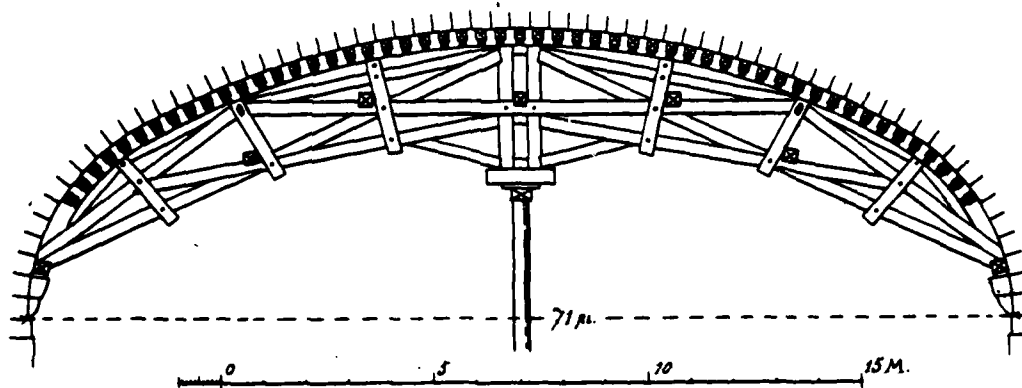


Fig. 6



Fig. 7

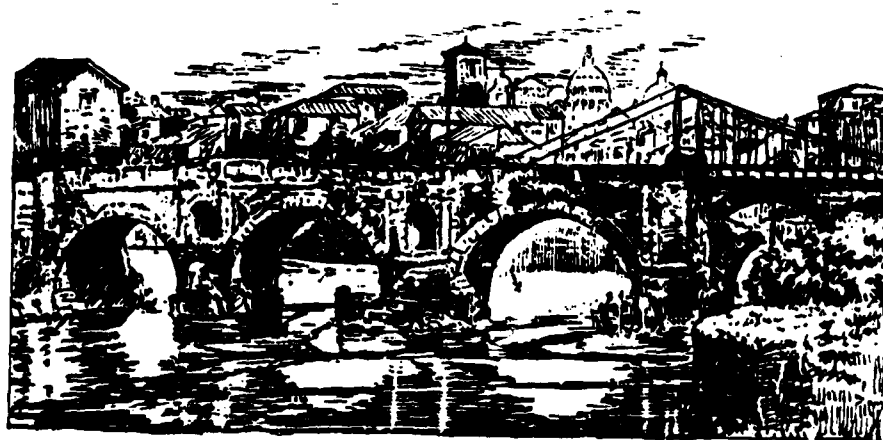


Fig. 8

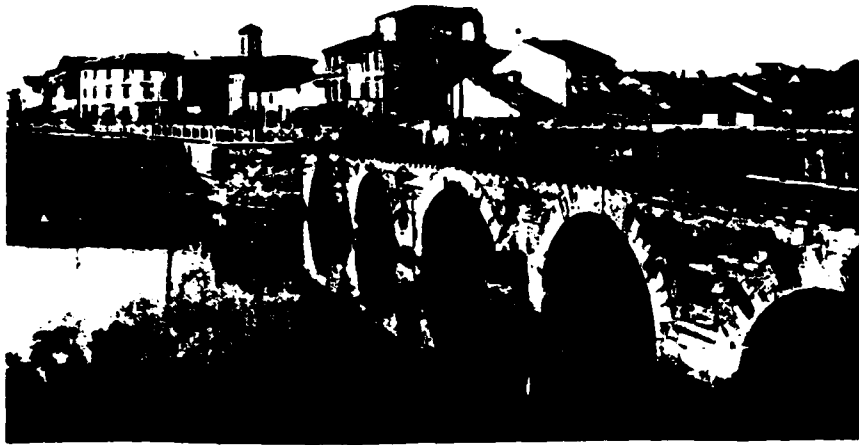


Fig. 9

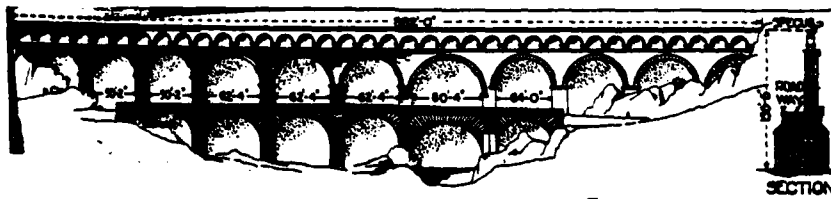


Fig. 10



during the Han period (206 B.C. - 221 A.D.). The Asia bridges appear, however, to have more often been cantilever or suspension types. The Chinese cantilever was a combination of stone and timber (Fig. 11). It was diffused from China to India where elaborate structures were built in Kashmir. Robin (1948:94-97) claims that the type is found in Africa, China, even in alpine Europe, but the best examples are found in the Himalayas. Chronology of bridges in Asia is not established with much certainty and it is not possible to positively state if the movement of the technique was from central Asia to the periphery or vice versa. Substantially built examples of the cantilever bridge are known in Tibet and Nepal.

Suspension bridge technology apparently diffused throughout China and India, but from where is not certain. The mountainous reaches of northern India saw early development of suspension bridges using iron chains in the seventh century A. D. This was centuries before similar developments took place in Europe (Gies, 1963:21-22). The iron technology was acquired from Sassanid Persia, a culture known for its work and skill in iron manufacture. Iron chain suspension bridges were built in Yunnan Province, as well as others near the Himalayan source area.

During the Sung dynasty (960-1280 A.D.) bridge and road building underwent a revitalization in China. The arch received new attention and arched bridges were built in abundance; Marco Polo observed "thousands." In any event, Chinese bridges showed expert stone masonry. Mortar was not known, thus large arches were often clamped together with iron keys. They possessed, in addition, knowledge of the pointed arch from western Asia as well as the segmented arch. Chinese bridges often had lofty arches over rivers known to have exceptional flooding, supposedly to allow junks to pass under.

It cannot be denied that the art of bridge construction developed to a sophisticated level in Asia. Aesthetics was also an integral aspect of Chinese bridge building, at least in later times, as is evidenced by the lovely serpentine, seventeen arch, Summer Palace Bridge in the Imperial Court outside Peking. By the time Marco Polo sojourned in Cathay, bridge building had acquired an interesting religious association where wealthy individuals spent fortunes on public bridges to insure their

safe crossing into heaven (Gies, 1963:24). At the same time in Europe religion was responsible for rejuvenating bridge building; engineering superiority soon shifted back to western Europe.

#### MEDIEVAL BRIDGE CONSTRUCTION

The unsettled European scene resulting from the eclipse of the Roman Empire witnessed the destruction of many bridges that would have surely withstood the test of time. The Barbaric Invasions ushered in an extended period of warfare that left few areas of Europe untouched. Early in the ninth century A.D., under Charlemagne, there was an expressed interest in repairing or building bridges. With the onset of the Holy Roman Empire conditions further deteriorated so that little if anything was done to build or preserve bridges. Rivers became territorial boundaries and as such any means of aiding crossing was met with fierce resistance.

One of the first important medieval bridges to be built was the Old London Bridge started in 1176 A.D. by Peter of Colechurch, the chaplain of St. Mary's (Fig. 12). It took thirty-three years to complete and served as the only bridge across the Thames until the middle of the eighteenth century; it was replaced by a new bridge in 1824.

Among the many bridges built in the medieval period, the accepted engineering triumph was the Pont d'Avignon (Fig. 13). It was the longest bridge built since Roman times, nearly 3000 feet, and remained the longest bridge in the world for a considerable time. Aqueducts excepted, it was the longest stone-masonry bridge ever built. A number of changes in construction technique are apparent in this bridge. One of its most striking features is the sharp upstream angle (thirty degrees) of the section across the main channel of the Rhone. The Rhone is a particularly treacherous river and subject to severe floods in historical times. Petit-Benoit, the builder, incorporated the use of an elliptical arch rather than the semi-circular. This reduced the necessity for massive piers and resulted in higher arches. This was a significant engineering advance in that it led toward producing a clearer waterway and therefore a bridge more secure against flood (Gies, 1963:30). The bridge stood against warfare and flood until, in 1602, a major flood collapsed an arch.



Fig. 11

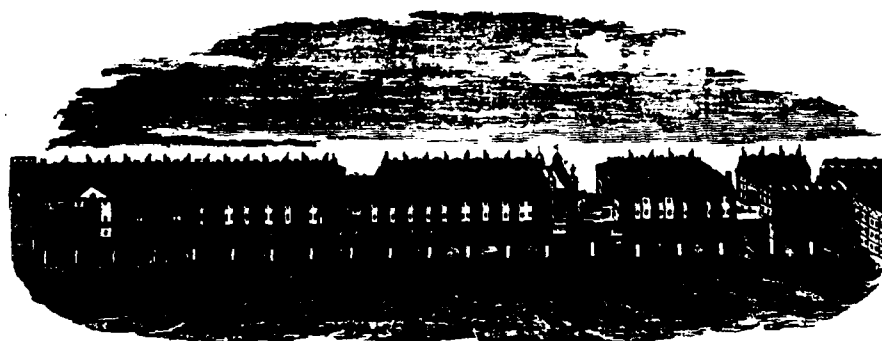


Fig. 12

Other floods took their toll and by 1670 only four arches remained of the original twenty or twenty-one. Interestingly enough, after 500 years of service the bridge, as a ruin, surpassed its fame as an engineering marvel.

Another feature of medieval bridges was fortification. Considering the nature of social and political conditions, many bridges were built with tall towers suitable for firing down upon boats on the river or troops on land. The Pont de Valentre at Cahors, France, (Fig. 14) is one such bridge. It is one of the finest and most complete fourteenth century bridges with its crenated piers and three tall towers. According to Whitney (1929:89) it has the "aspect of a well-disciplined warrior."

Another well-known bridge of the medieval period in the Ponte Vecchio (Fig. 15) over the Arno River in Florence, Italy, built in 1345. This is one of the earliest bridges with arches in the form of flat circular arcs, a form reminiscent of modern stone arches.

Bridges were also being constructed in the British Isles, particularly after the Norman Conquest. All in all medieval bridges were not as well constructed as their Roman predecessors. Considering the fact that many, if not most, were built without adequate funds and under the duress of war, they stand as a tribute to the courage and perseverance of their builders. Against great odds they were finished and served admirably for centuries.

#### THE RENAISSANCE

The intellectual reawakening after the Dark Ages encompasses every visible aspect of culture. Art and science once again rose to respected levels. Out of the new appreciation for beautiful things came bridge construction possessing a new beauty and grace. The Renaissance was also a period of renewed mercantilism and notable urban growth. The best examples of bridges of the period, consequently, come from important cities. A noted center of revived art was Italy. In Venice the famous Rialto Bridge was constructed in 1590 (Fig. 16). For grace and originality in design the Ponte S. Trinita over the Arno in Florence is noteworthy (Fig. 17). Bridges constructed in Florence and Pisa are especially noted because they are associated with open waterfronts such that they



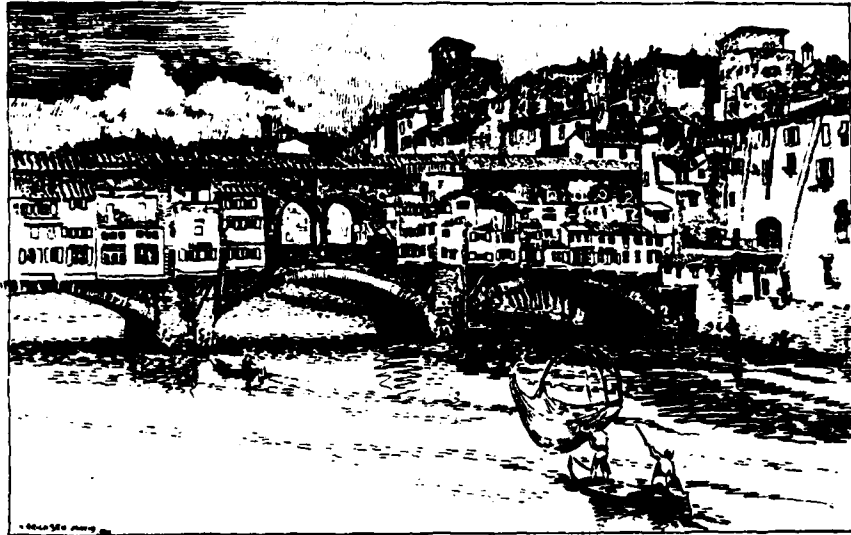


Fig. 15

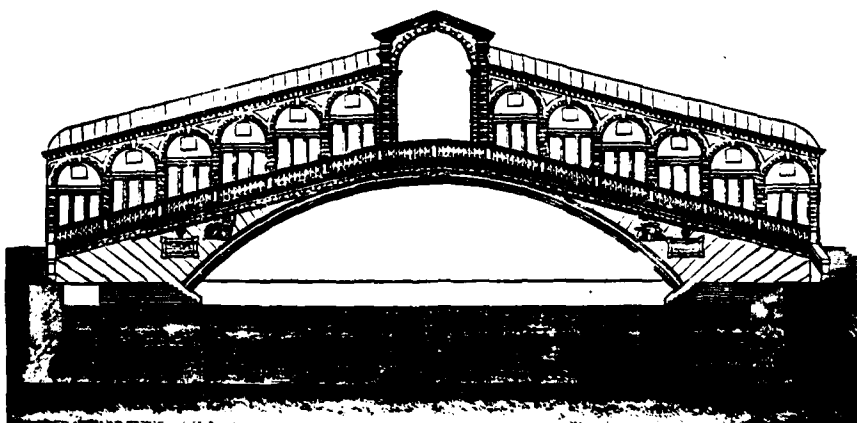


Fig. 16

are well situated for observation. An appealing aspect of the Renaissance is that bridge aesthetics took on more importance. The style of adjacent buildings, vistas and proportions became significant.

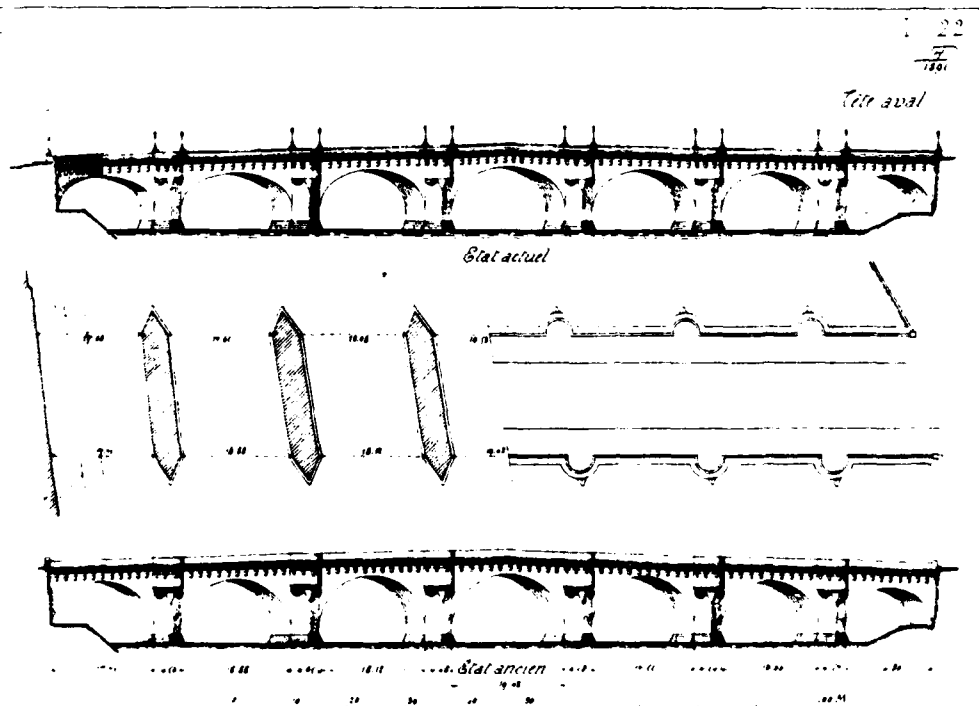
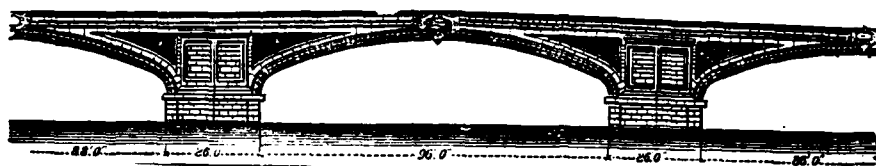
French bridges followed the best Roman tradition, but new designs emerged that set the basis for the more scientific bridge building of the eighteenth century. Among the better known bridges are those of Paris - the Pont-Neuf (Fig. 18), the Pont Saint-Michel (Fig. 19), the Pont Marie (Fig. 20) and the Pont Royal (Fig. 21). A discouraging aspect of most French Renaissance bridges was the poor foundation work that periodically necessitated major restorations. The architectural style of the Pont Royal was frequently copied, however, during the eighteenth century.

All in all the Renaissance was a period of architectural refinement. As yet there was no distinction between architect and engineer; the emphasis on structural principles was not as advanced. Indeed, Whitney (1929) makes a firm case that it was precisely the rapid development of structural analysis, associated with the development of engineering as a distinct profession and a de-emphasis of architecture, that has resulted in the construction of so many modern bridges which are engineering feats but aesthetic disasters.

#### THE EIGHTEENTH CENTURY

The eighteenth century saw the development of engineering as a profession. In France, the Ecole des Ponts et Chaussees was established. Many stylistic changes emerged as a result of new structural principles. It was also in this century that a momentous event for future bridge construction took place - the first iron arch was cast in Lyon, France (Whitney, 1929:154). The first iron bridge was later erected in England, in 1776, and by the end of the century numerous iron bridges were known in both England and America. The design of bridges had to change to compensate for the new materials; economy of material and design, guided by mathematical rules, came to dominate the profession. In spite of the advances in design, most bridges were still of stone.

An important French engineer of the period was Jean-Rodolphe Perronet. He was innovative, and many of his bridges were remarkably bold and





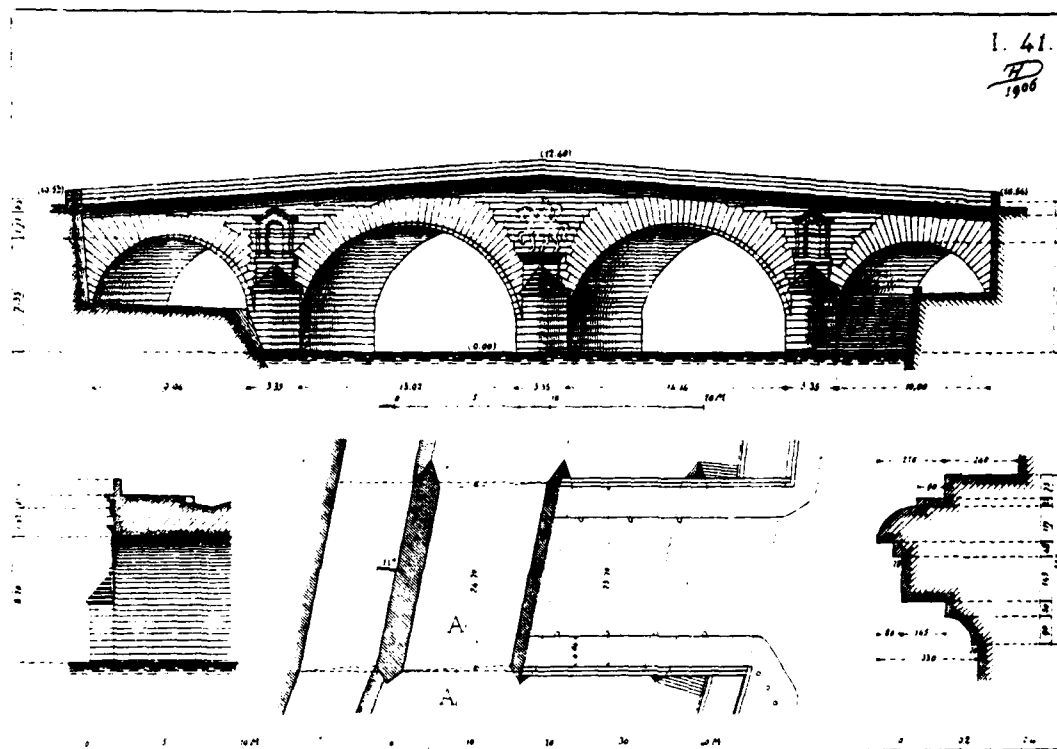


Fig. 19

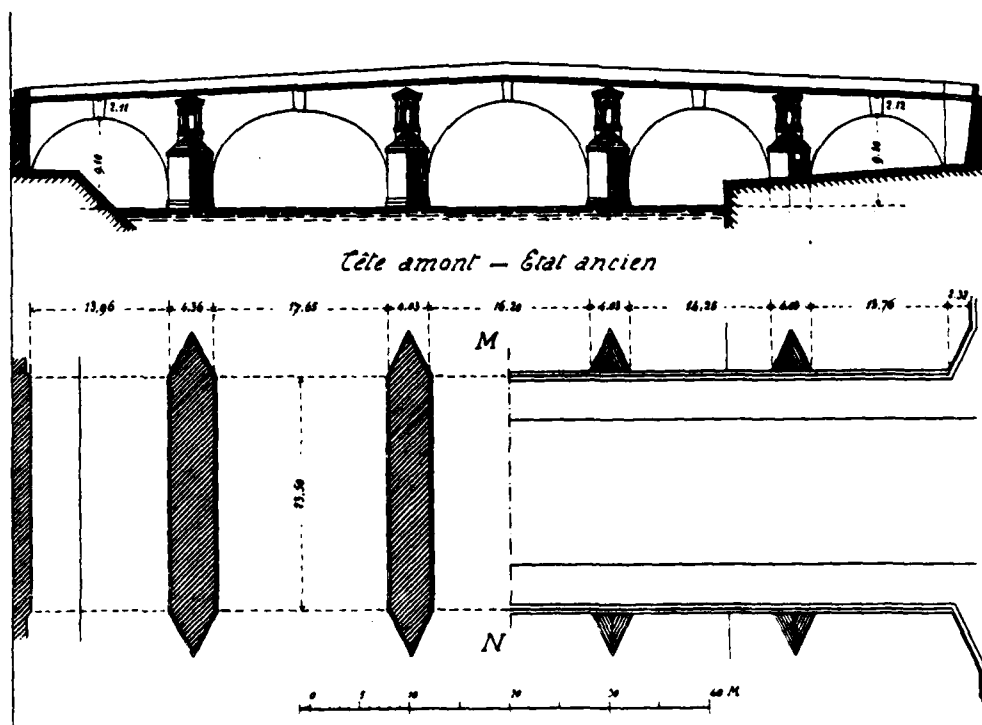


Fig. 20

efficient for the times. He did major revision with foundation construction techniques, a problem of no small consequence throughout the previous history of bridge building in Europe. Perronet excavated below the water line before sinking pilings and even then pilings were driven all the way to solid ground. As was traditional, interstices were filled with stone and mortar (Fig. 4). On top of this the heavy masonry of the piers was laid and carried up to the water line. The net result was to create a substantially stronger pier foundation and thus prevent expensive restorations in the future because of floods, settlements due to weight and traffic, or scouring.

Another development by Perronet, that became more popular in the nineteenth century, was a significant reduction in the size, i.e. width, of the pier. Piers became much smaller in proportion to the span of the arch (Fig. 22). His last and most important work was the Pont de la Concorde in Paris (Fig. 23). Although he was recognized as the foremost bridge authority of his day, the design was too radical and not accepted as submitted. He made a number of changes but was able to persuade authorities to keep the piers narrow, thus allowing the bridge to retain some of its aesthetic quality.

Important bridges were also being constructed outside of France. The Westminster Bridge (1738-50) was built by the Swiss engineer Labelye. Labelye is credited with the introduction of the caisson method of building bridge foundations and is reputed to have used it on the Westminster Bridge, built to relieve traffic on the old London Bridge (Whitney, 1929:179).

While the French were perfecting stone bridge construction, the English were busy experimenting with iron. In 1776 an iron bridge was cast at the Coalbrookdale Iron Works and erected over the Severn at Coalbrookdale (Fig. 24). Other experiments were conducted. In America the first modern suspension bridge, having a horizontal floor and suspended from wrought iron chains, was built by James Finley. As it became apparent that iron was a suitable, and practical, building material for bridges, the stage was set for modern bridge building in the nineteenth century.

#### MODERN BRIDGES

Modern bridge science is largely a product of the nineteenth and twentieth centuries. Iron was introduced in the eighteenth century and

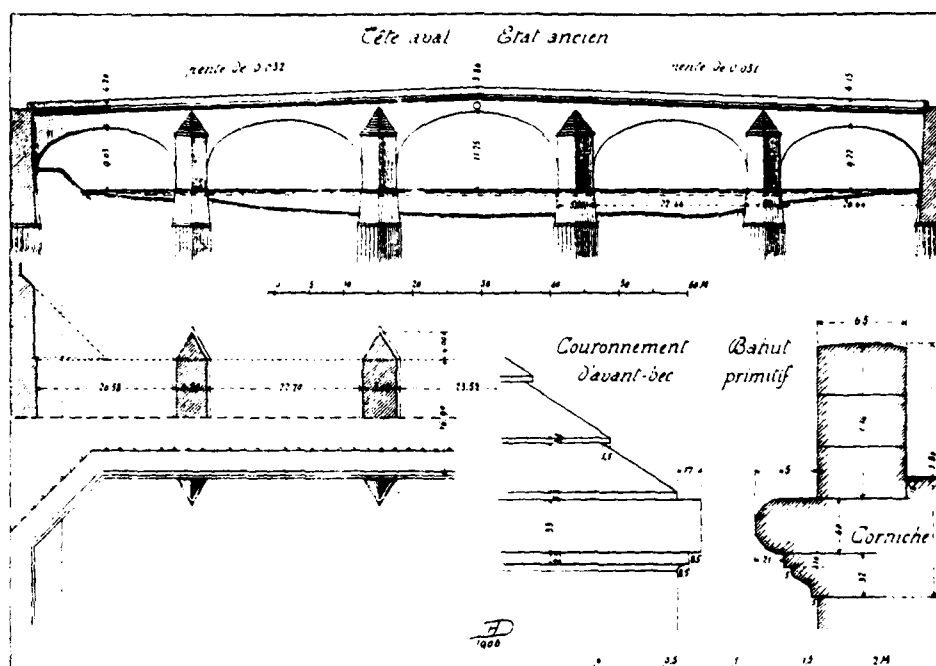


Fig. 21

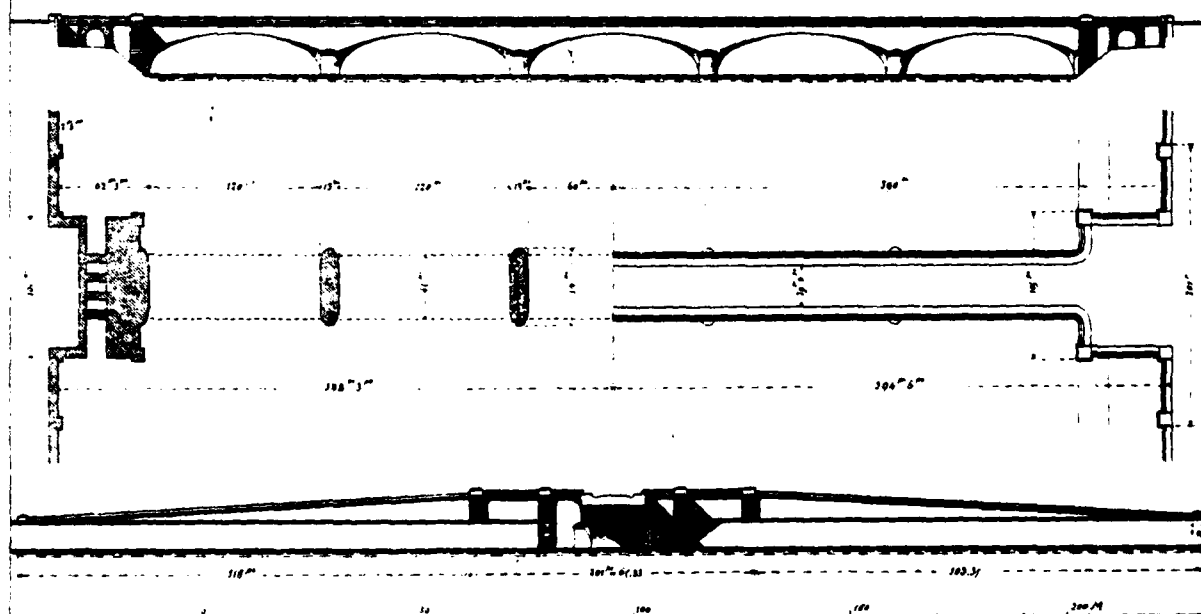


Fig. 22

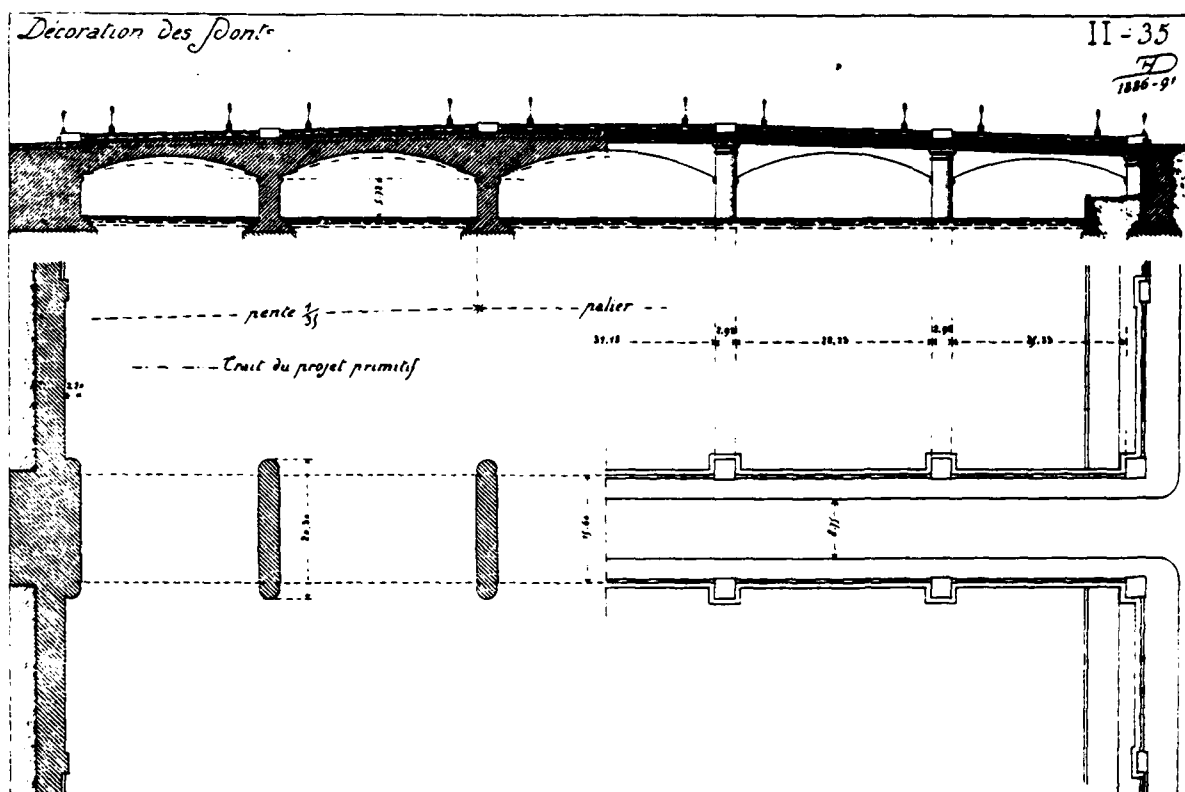


Fig. 23



Fig. 24

became a major competitor of stone. Since then steel and concrete have become the standard construction materials.

The entire spectrum of bridge building underwent a rejuvenation in the nineteenth century as a consequence of the influx of railroads. Not only did the demand for the number of bridges increase, but the technical requirements for railroad bridges were different from highways. Railroad bridges not only had to be more level, but constructed to carry heavier loads as well. Stone bridges continued to be built through the nineteenth century, but cast-iron bridges became increasingly common in England; in the United States the preferred building material was wood.

According to Whitney(1929), as modern bridge development evolved, the association of art and engineering declined. He made an insightful observation and there appears to be value in what he says - modern bridges are not as graceful nor are they as compatible with their surroundings as in previous centuries. The process in America continues to this very date such that many bridges constructed within the last fifty years have little, if any, artistic merit.

The shift to concrete as the dominant bridge material, the death knell for stone bridges, came early in the twentieth century. A style of concrete bridge popular in the United States and elsewhere in the 1930s was developed by M. P. Sejourne, a well-known French engineer. The design consisted of two separate arch ribs, side by side, with a roadway carried on columns. While his design was for stone, it was copied elsewhere in concrete and became a prototype for a number of years. It eliminated much masonry from the arch ring and the open network of columns on the arch (Fig. 25) reduced the cost of construction. Concrete surpassed stone as a building medium because it was cheaper, more adaptable to form, and quicker to set.

To step back a moment, however, American bridges, as mentioned, were initially of wood. American bridges were built on a grand scale, often exceeding a mile in length. Stone piers were common, but the superstructures were almost entirely of wood and frequently covered. A masonry tradition never developed in the United States (Fitch, 1973:155).

The earliest American bridges were corduroy bridges built by spanning a creek or stream with timbers and then covering these supports with logs across the supports (Sloane, 1954:81). The most distinctive wooden

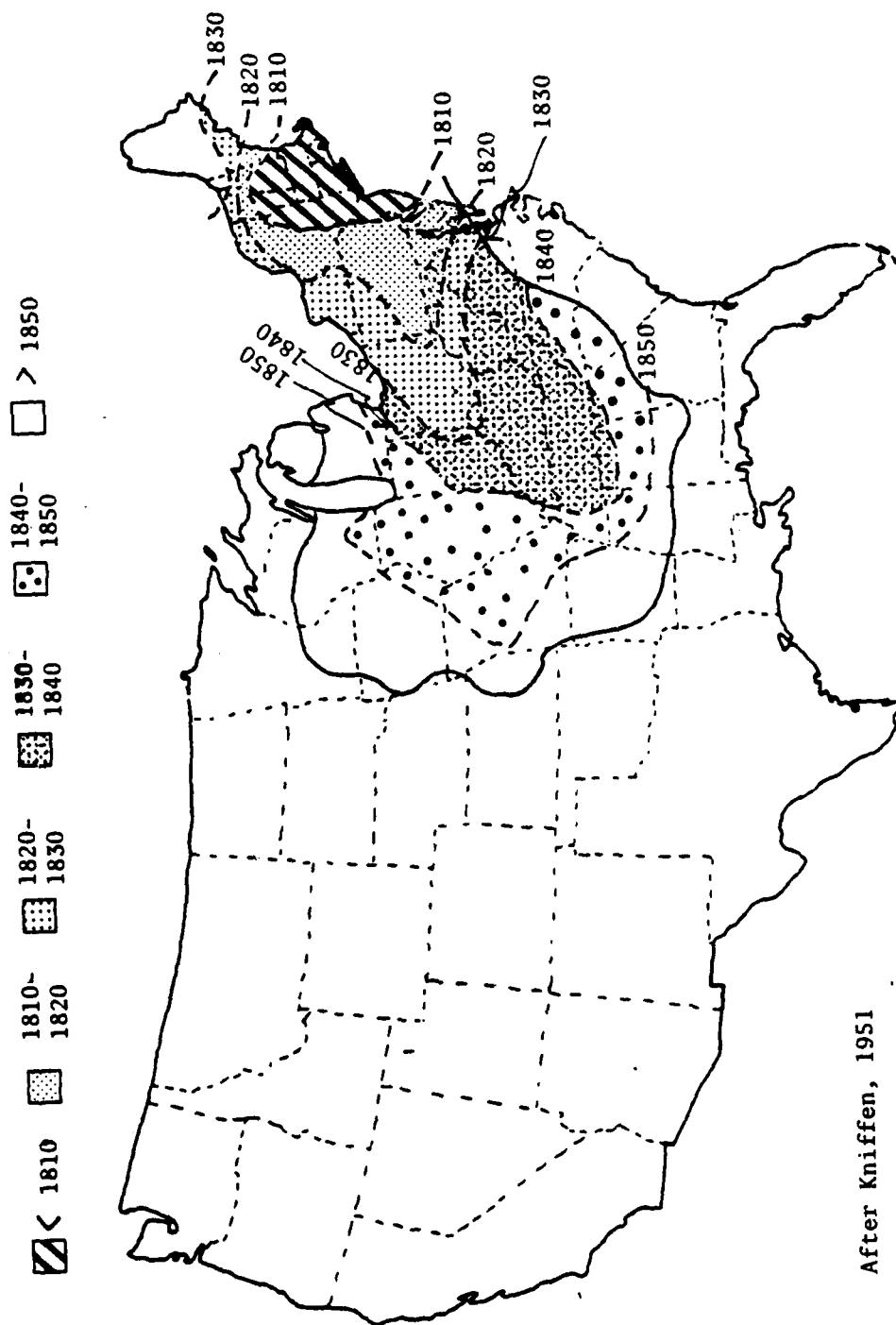
bridges in America were covered ones. Covered bridges were known in Europe, but New England builders developed their construction to a fine art. From this source area it spread to other parts of the United States, to Canada, and even back to Europe where the type originated (Kniffen, 1951:114). Much of the history of covered bridges lies obscured in ancient history; most of the current popular information is shrouded in a mist of speculation and romanticism. American bridge builders, nonetheless, developed the skill to a degree unknown in any other part of the world.

The earliest sophisticated bridges date from the latter half of the eighteenth century. Their design and construction were debated until the early nineteenth century, but after 1810 seem to have become a generally accepted practice of spanning rivers and streams (Kniffen, 1951:118). Initially they combined the principles of both the arch and truss until the truss became the accepted design for most short spans.

More importantly, the covered bridge became accepted as the proper bridge design and diffused rapidly throughout the eastern United States and even to the Pacific West Coast (Map 2). By 1850 the maximum extent had been achieved; within the area the number of bridges continued to expand considerably. After 1860 its diffusion had virtually ceased. While the exact reasons are not known, it is reasonable to postulate that the increasing sophistication of bridge-building technology, based upon complex mathematics and new designs built of iron, displaced this important cultural artifact.

Much of the new iron bridge design and technology came from England (Whitney, 1929:193). Rudimentary experiments were being conducted with suspension bridges using wrought iron chains. The real innovations in suspension bridge technology, however, developed in America. While France and England dabbled in this area, it was the Americans who are credited with having invented the use of wire cables. Cast-iron, however, remained the preferred building medium until nearly the end of the nineteenth century. By that time steel, which had been perfected as a result of the Bessemer process discovery in 1855, gradually took precedence. Arch and suspension bridges were abundant. Iron permitted a greater variety of forms and when it was found that arch and suspension types were not suitable for all situations, various forms of girders and trusses were

Map 2. Diffusion of the American covered bridge.



After Kniffen, 1951

invented. It is from the evolution of bridge technology that we get such types as the Pratt and Warren trusses. Most of the metal trusses in America were one of the above or a variation on the form (Comp and Jackson, 1977:no pagination). Both forms date from the 1840s and were used so extensively that their versatility, durability, and economic desirability made them popular until well into the twentieth century. Most of the bridges over the Coosa River are a variation of these forms (Fig. 26).

The long, complex, and colorful history of bridge development continues. An understanding of the antiquity of bridge building aids in developing a perspective for the complexity of the technology used in constructing today's impressive, although not so aesthetic, railway and highway bridges. The evolution of bridge design, to the period of the popularity and geographic ubiquity of the Pratt and Warren trusses, sets the stage for a look into the development of the transportation network in central Alabama, and the Coosa River bridges in particular.





## NOTES

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2. Charles S. Whitney. Bridges: A Study in Their Art, Science, and Evolution. New York: William Edwin Rudge, 1929.
3. Frederick William Robins. The Story of the Bridge. Birmingham, England: Cornish Bros. Ltd., 1948.
4. Eric Sloane. American Barns and Covered Bridges. New York: Funk and Wagnalls, 1954, pp. 80-112. See also Fred B. Kniffen, "The American Covered Bridge," Geographical Review, Vol. 41, No. 1 (1951): 114-123.
5. T. Allen Comp and Donald Jackson. "Bridge Truss Types: A Guide to Dating and Identifying," History News, Vol. 32, No. 5 (May), 1977. (Technical Leaflet 95, American Association for State and Local History).

## Chapter 2

### DEVELOPMENT OF THE ALABAMA ROAD AND RAIL SYSTEM

The earliest roads in Alabama most likely paralleled the major Indian trails. There are no specific records attesting to this, but it is known that various Indian tribes gave consent to have roads across their lands. It is logically presumed that many of these coincided, at least, with some of the larger trading paths. A brief summary of the history of Alabama roads can be divided into a frontier period, an antebellum period, later nineteenth century, early twentieth century and the post-World War II periods. The first railroads were laid in the 1830s and had surpassed their zenith by the end of the 1930s; rail development will be considered separately at the end of the chapter. There is little specific information available on the Coosa Valley itself. Various legal documents yield copious data not used here. The intent is not to burden the reader with detail but to present a concise overview of the evolution of transportation systems within the state, with reference to the Coosa Valley when practical.

#### FRONTIER ROADS

Travel in the early days of the Alabama territory was always precarious. Roads, at least that is what they were called, took a variety of forms, all for the most part poorly maintained. They were crude, often nothing more than simple clearings through the woods with stumps a bare three to five inches from the ground. Traveling in wagons was difficult at all seasons, but exceptionally frustrating during wet periods when the roads became quagmires. During the formative years of Alabama, at least as much travel seems to have used the territory's vast river system. By the 1820s steamboats were active on all of the area's major navigable streams, but particularly so in the southern half of the state. Settlement in the Coosa Valley came predominately after 1835, some of it by steamboat (Small, 1951:183). Needless to say, travel by river offered a number of advantages compared to overland modes.

Inasmuch as rivers served as roads, they also presented problems for the overland routes. Small streams and creeks could be forded. Alabama's topography, however, has resulted in the formation of a number of deeply incised river valleys that have presented difficulty for bridging until recent times. Initially, of course, there were no bridges across major streams. This led to the establishment of a lucrative ferry system. Initially a number were owned and operated by Indians; later whites took dominance. Since tolls were high, ferrying was a desirable occupation capable of generating a comfortable cash surplus.

#### ANTEBELLUM ROADS

The network of roads across the state continued to expand. The minutes of the County Commissioner's Court from counties throughout the state attest to the activity of road and bridge building. Roads were, of course, mostly ungraded wagon roads. Bridges were variously covered and remained in service until replaced by open, steel truss bridges in the late nineteenth and early twentieth century (Brannon, 1929:27).

The rivers continued to be important for transportation throughout the antebellum period. This was the golden age of the steamboat and scarcely any major stream of the state was without its share of steamers and packets. By the end of the period, bridge building had really come into its own and the ferry system began to diminish. The use of ferries continued up until World War II, albeit sporadically.

Overland routes witnessed some renewed attention as well. This was an era of experimentation and one of the more pervasive was the plank road. Plank roads appear to have been common between 1848-1857 (Dodd, 1975:n.p.). This road type was constructed by laying thick boards across long strips of wood called stringers. One of the more ambitious of these projects was the Central Plank Road chartered, along with dozens of others, in the 1849-1850 Legislative Session. It was eventually to connect the waters of Mobile Bay with the Coosa River at Wetumpka, and eventually with the Tennessee. The project, like all the others, was unsuccessful. High construction and maintenance costs, exorbitant tolls, too few travelers, and the ever present, more efficient steamboat spelled doom for this phase in Alabama road construction.

Mention should be made that it was during antebellum years that the railroad was established as a major transportation element upon the landscape. The first line was established in the 1830s but the real heyday came in the latter nineteenth century. In 1860 there were over 100 companies sharing track mileage in the state with the average operating length being eighty-five miles (State of Alabama, 1980:9). Until the end of the Civil War the rail focus in the state was on Montgomery, Alabama, the administrative center. Later shifts of industrial interest led to the present focus on Birmingham, Alabama.

#### LATTER NINETEENTH CENTURY ROADS

The state transportation system was dominated by the railroad during the last quarter of the nineteenth century. By 1880 most of the rail network presently existing was in place. Mileage had increased from 132 miles in 1850 to 1843 miles in 1880. By 1899 there were 4051 miles of track, approximately the same amount as 1976 (State of Alabama, 1980:10).

Historically rail lines, much like major roads, had a decided north-south trend. The focus appears to have been the connection of central and northern Alabama with decent Gulf port areas. All sections of the state were interlocked and tied into the national rail system. Much of the complex, romantic history of the railroad at the state level mirrored similar attitudes in operation at the national level. The two leading systems in Alabama were the Louisville and Nashville (L & N) and Southern (Sou.) railroads. This historic period witnessed the boom and growth of Birmingham's industrialization; the railroad was her help mainly resulting in the shift of rail focus to the industrialized north. The original bridges must have been wooden trestles as Alabama is fortunate to have a number of early railroad bridges dating from the turn of the century. Common to other regions of the United States, the Pratt and Warren trusses became the standard bridge form for both rail and road; the through truss became popular for railroads, the pony truss for automobiles and wagons (Comp, 1977:n.p.;Appendix 1).

During this period improvements in technical abilities were being developed in preparation for the automobile. The rise of the automobile industry in the 1890s, and the decade immediately following, had a

profound impact upon heightening public awareness of the sorry state of local roads.

#### TRANSITION-TURN OF THE CENTURY

During the period from 1890 to 1920 the extent of the road network in Alabama gradually increased. There was a general demand for better roads; it was during this era that the push for farm-to-market roads and better rural free delivery routes came to the fore. By 1912 all road construction in the state was handled by individual counties, generally financed with bonds or county warrants. The Alabama State Highway Commission was founded in 1911; its principal role was to educate the population concerning road safety and the advantages of a well-maintained road system, as well as to give advice on how to construct the best roads.

#### THE PATCH ROAD ERA-1920s

The 1920s have gone down in Alabama highway history as one of her less progressive eras. Because of the physical geography of the state, the gently rolling to steep hills have created a topographic nightmare for engineers. With local relief often exceeding two hundred feet over much of the northern one-half of the state, bridge construction had been costly and slow. The immense costs of road construction during the period leading up to the Great Depression was partially responsible for the low-level maintenance spawning the colloquial term for the era - patch road.

Ironically, one of the major accomplishments of the state's new highway department was bridge building. The Federal Highway Act of 1916 and the State Toll Bridge Act of 1927 were important legislative aids. The state act resulted in the construction of fifteen major bridges, including the attractive concrete arch bridge over the Coosa River in Gadsden, Alabama.

#### THE MODERN ERA-1930s TO PRESENT

For lack of a better term, and to expedite the handling of spotty data, the last fifty years have been designated the modern era. The Great Depression, of course, witnessed a reduction in operating capital

for all segments of the United State's economy. It was, however, a period of Federally-subsidized programs, an important one for road and bridge construction being the Works Progress Administration (WPA). Under the WPA nearly 400 miles of roads and over 5,000 feet of bridges were completed. The majority of all roads constructed through the 1930s continued to be unimproved dirt roads. Traveling was arduous, time-consuming, and messy.

The period following World War II witnessed an even greater demand for improved roads and bridges. While many routes, including many of those in the Coosa Valley, were graded and drained in the 1930s and early 1940s, asphalt paving did not occur until the late 1940s onward. For example, Alabama highway number 22, which crosses the Coosa River just below Mitchell Dam, was graded and drained in 1930 and the route paved in 1948. The present bridge was constructed in 1958; prior to that a toll ferry operated just south of the bridge. The post-World War II era was a watershed in American transportation; the blacktop road and the automobile became American symbols. The increased mobility generated new public demands. As with other segments of American culture, certain facets of the route geography changed. The ferry system waned as new bridges were constructed. Covered bridges, a symbol, so to speak, of American ingenuity, became anachronisms, eventually to suffer derelection and the ultimate indignity at the hands of arsonists and vandals.

The newest wave of highway development is, of course, the interstate system. High-level technology has generated higher performance automobiles with greater speed and long-range mileage capability. The demand for smoother, wider, and straighter highways has been the inevitable consequence of an auto-oriented society. Thus today, the unimproved dirt road is a symbol of transportation lag, the number of miles of unimproved road being a statistic most bureaus or agencies would prefer not to see bantered about. Roads have undergone an incredible positive transformation, as have bridges. Nonetheless, one must recognize that part of the penalty for technological advancement is the loss of aesthetics and nowhere is this better seen than in bridge construction. While current bridges can attest to the high level of engineering expertise, they have lost a quality that has for centuries lured mankind to visit and marvel at one of technology's triumphs.

## NOTES

Data were taken largely from newspaper clippings and short essays written by Peter Brannon, an early administrator in the highway department who wrote a series of columns in state newspapers on the history of roads and travel in Alabama (see entries in bibliography). An unpublished manuscript on the development of transportation in Alabama by Don Dodd and Gary Reeves was also useful. In addition, a number of items by anonymous writers kept in the general files of the library at the State Department of Highways were consulted. It should be noted that Peter Brannon, obviously a prolific writer, did most of the basic research and writing on Alabama roads; other writers paraphrased his works.



### Chapter 3

#### ANALYSIS OF BRIDGE SITES ON THE COOSA RIVER

The constant effort to design and build safe, economical bridges had been a concern of engineers for many decades. The rapid development of bridge design in the latter nineteenth century reflects the swift changes and innovations in American technology. An increasing demand for more and better bridges coupled with new and cheaper construction materials represented a tremendous challenge to bridge engineers the world over. New designs and construction techniques appear to have developed overnight. The evolution of modern bridge types was, therefore, rapid and experimentation with design profuse. Consequently, it is difficult to draw hard and fast lines along a historical continuum insofar as these designs are concerned.

Of all the bridge types, the iron and steel truss became the most popular. Relatively inexpensive to build, safer because they were fire-proof, and capable of carrying significantly heavier loads than wooden bridges, iron and steel trusses became the symbol of modern bridge development. In the early twentieth century reinforced concrete developed as a fast, relatively inexpensive means of bridge construction.

Another important innovation in bridge design was the moveable bridge. Rivers important for navigation presented special problems of design. For the Coosa River the swing span was most often employed when there was a demand for channel clearance. A swing span was a distinct unit of the bridge capable of rotating or swiveling ninety degrees such that the span became parallel to the flow of the river; this was an especially good design for wide rivers.

There are thirteen bridges included in this section that have been analysed from a cultural, historical, and engineering viewpoint. They are listed below in order of ascending location across the Coosa River proceeding from the vicinity of Mitchell Dam northeastward to Gadsden (see Map):

1. Alabama Highway 22 below Mitchell Dam.
2. Southern Railway System south of Childersburg.
3. U. S. Highways 280 and 231 at Childersburg.
4. Central of Georgia Railroad Company bridge at Childersburg.
5. Seaboard Coast Line Railroad north of Childersburg.
6. Interstate 20 east of Pell City.
7. U. S. Highway 78 east of Pell City.
8. Southern Railway System east of Pell City.
9. Seaboard Coast Line Railroad below Neely Dam.
10. Old Alabama Highway 77 south of Gadsden.
11. Old U. S. Highway 431 and 278 at Gadsden.
12. Louisville and Nashville Railroad at Gadsden.
13. New U. S. Highway 431 and 278 at Gadsden.

HIGHWAYS

## Alabama Highway 22 below Mitchell Dam

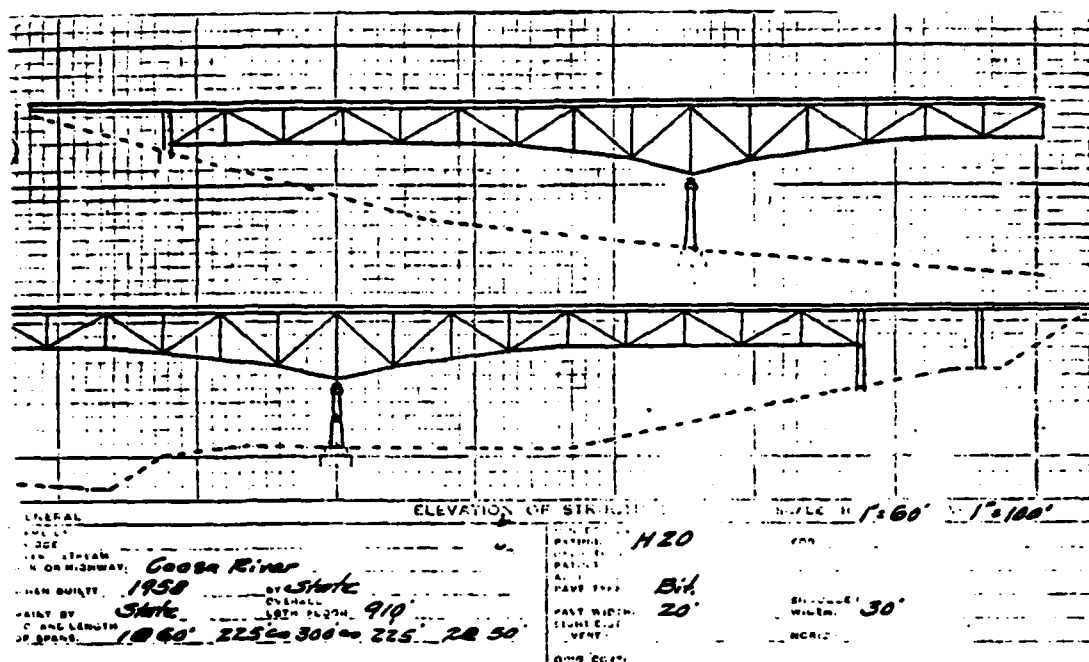


Fig. 27

This bridge, built in 1958 by the State of Alabama over the Coosa River just south of Mitchell Dam, consists of I-beam and truss spans for a total length of 910 feet. It was built to improve crossing of the river. The road straightened somewhat before bridge construction and generally improved connection of east central Alabama with the Black Belt region. Prior to construction of this bridge there was a toll ferry just south of the bridgehead. Alabama highway 22 was graded and drained in 1930 and the old section down to the ferry was paved in 1948. The old ferry landing on the east bank is now private property; on the west bank it is used as a public boat ramp.

The bridge is built across a wide, straight stretch of the Coosa River between rock faces with steep inclines to the river. It consists of three concrete approach spans (one on the west-60 feet, and two on the east-50 feet each) and three deck spans (steel Warren riveted) of 225 feet, 300 feet, and 225 feet respectively. Each 225 foot span consists of nine panels of 25 feet each; the central 300 foot span contains twelve panels of 25 feet each. The approach spans are steel I-beams.

The recent construction date, lack of appreciable historic significance, and typicality of design does not make this bridge particularly significant as an engineering resource. For these reasons I would not recommend this bridge be considered eligible for nomination to the National Register.

## U. S. Highways 280 and 231 at Childersburg

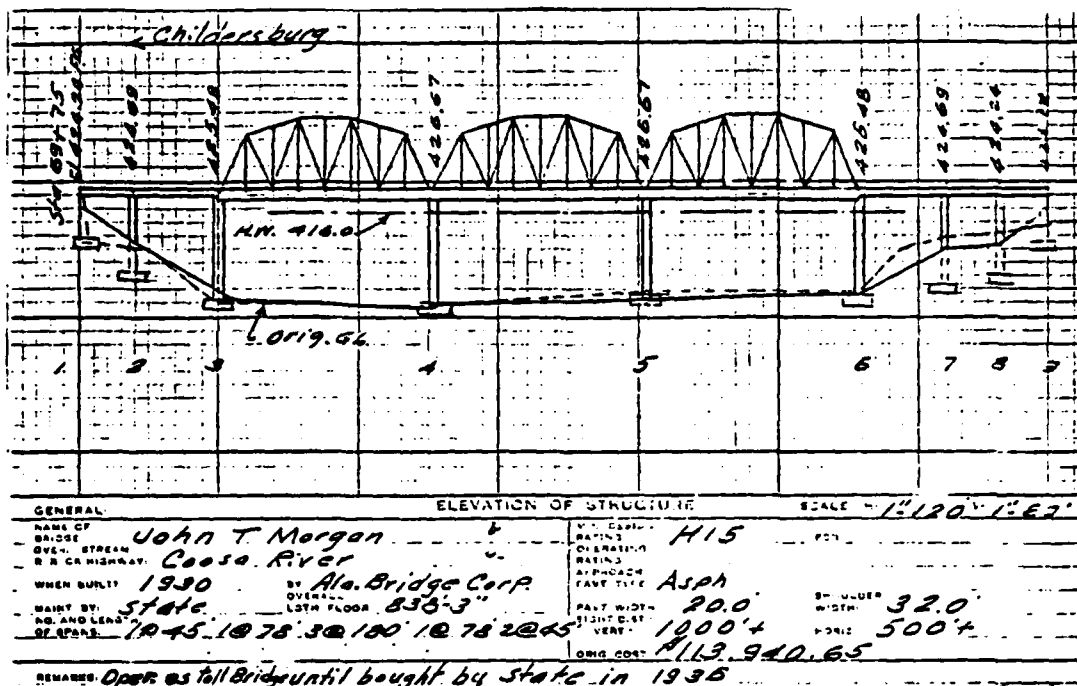


Fig. 28

This bridge was built in 1930 by the Alabama Bridge Corporation at a cost of \$113,940.65. It was operated as a toll bridge until it was bought by the state in 1936. It is one of a number of bridges authorized by the State Legislative Act of 1927. There was a desire for and need to link the highway systems to improve development of the state's economy; these toll bridges figured importantly in the overall scheme. This particular bridge was part of the effort to improve the Florida Short Route (portions of U. S. Highways 78, 231, and 280). The bridge spans the Coosa River at Childersburg and was dedicated June 12, 1930, to the memory of John Tyler Morgan, a distinguished Alabama citizen and U. S. Senator. It connects Talladega and Shelby counties and covers a length of 838 feet, 3 inches. Prior to construction of the bridge, a ferry site south of the bridgehead handled traffic. The ferry itself operated for nearly a century.

John T. Morgan, for whom the bridge was named, was born in Tennessee in 1824. The family later moved to Alabama and settled in Calhoun County. He was admitted to the bar in 1845 and elected to the U. S. Senate in

1876. An advocate of an Isthmian Canal, he is regarded by historians as the father of the idea; he favored a northern route through Nicaragua. He served on the Committee for Foreign Affairs, the Bering Sea Fisheries Commission and was appointed to draft the code of laws for the Hawaiian Islands after they became a territory of the United States. He died in office in Washington, D. C., and was buried in Selma, Alabama, where he had resided before his election to the Senate.

The John T. Morgan bridge consists of steel I-beam approach spans of forty-five and seventy-eight foot lengths (on the west - 1 of 45 and 1 of 78 feet, on the east - 2 of 45 and 1 of 78 feet). The main length of the bridge consists of three 180 foot spans of steel riveted Warren thru trusses with a camelback form.

The most significant historical association of this bridge is its past role as a toll bridge and one of the bridges authorized by the legislature in 1927 to link the state's highway systems. In addition to its significance as a link in the state's highway systems, and thus a broader significance as an important innovation in improving intra- as well as interstate communication, the bridge incorporates the distinctive characteristics of a recognized bridge type (Warren truss). For these reasons the bridge is considered eligible for the National Register.

## Interstate 20 east of Pell City

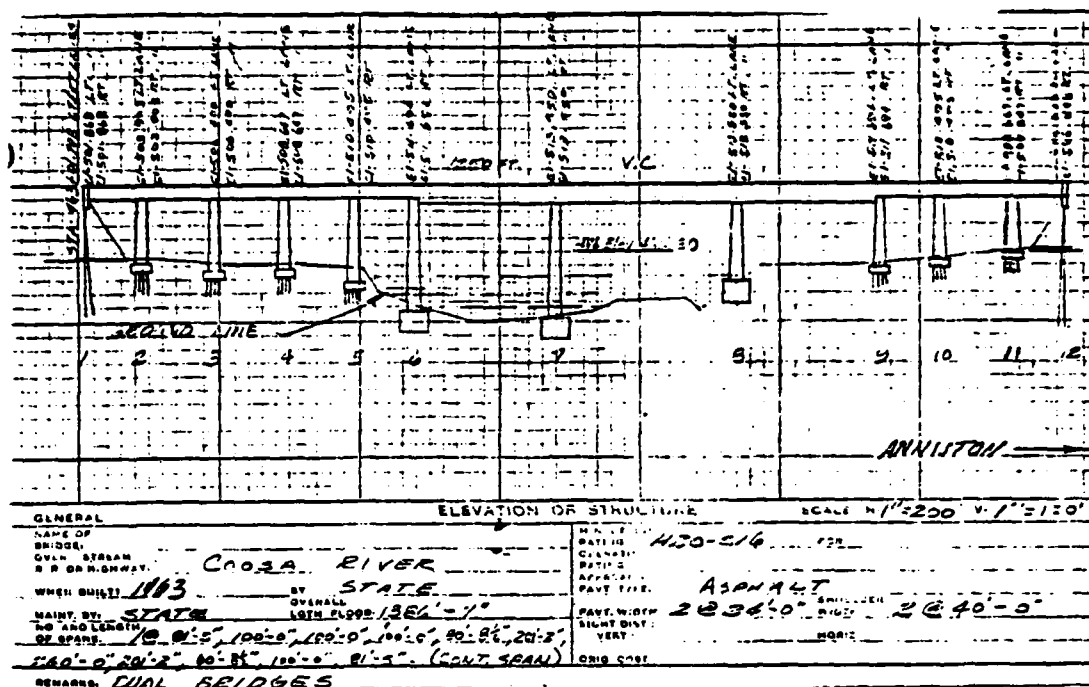


Fig. 29

This is a set of dual bridges across the Coosa River east of Pell City. The bridges are steel I-beam and girder designs with a total span each of 1386 feet. The bridges were constructed in 1963 by the state as part of the Federal interstate system. The recent construction date and standard design of these bridges do not make them eligible for the National Register and thus they are not recommended.





The bridge is a steel riveted Warren thru truss design with a camelback shape. The bridge was raised in 1971 and new approach spans were constructed. There are twelve approach spans of thirty-four feet each (five on the west and seven on the east). The truss spans are 200 feet, 232 feet, and 200 feet. The larger of the truss spans is in the center and is an inoperable swing span. The total length of the bridge is approximately 1040 feet. The bridge has been damaged from excessive use and oversized loads. The concrete on the main piers is disintegrating, and disintegration is evident on caps, girders, handrails, and the deck girders. In addition there has been damage from collisions to various members of the truss spans.

The Bankhead Bridge is part of a transcontinental route that runs from Charleston to Memphis, a route known as The Bankhead Highway. There is greater historical than engineering value to the bridge, but it is one of the few swing bridges on the Coosa, albeit inoperable presently. Because of its age, its association with Senator Bankhead, and as a former swing bridge, I recommend this bridge be considered eligible for nomination to the National Register.





This is one of the few concrete arch bridges still standing in the state and only one of two on the Coosa in Alabama. It is an important engineering resource by virtue of its being an example, and an excellent one too, of a major building medium of the early twentieth century. It has value therefore from both an architectural, historical, and engineering point of view and the bridge is recommended for consideration by the National Register.



RAILROADS

# Southern Railway system just south of Childersburg

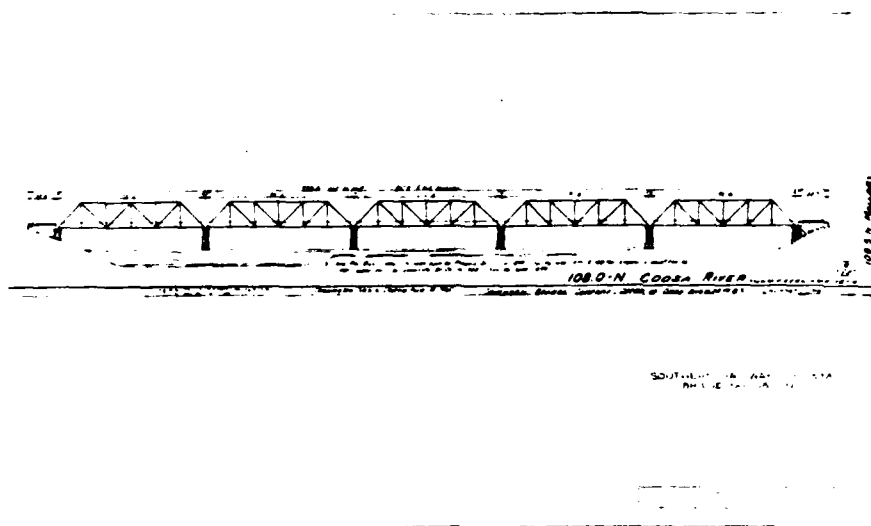


Fig. 34

This five span bridge crossing the Coosa just south of Childersburg is owned by the Southern Railway Company. It consists of one 172 foot span and four 170 foot spans; the overall length of the bridge is 933.3 feet. The eastern most span, a Warren truss, of 170 feet was built by the Phenix Bridge Company in 1902. The bridge is mostly a Pratt thru truss design that is pin-connected rather than riveted. The piers are of stone and the bridge is apparently in good condition despite long use.

The line of the Southern Railway system is and has been primarily for freight use. This is one of the oldest pin-connected truss bridges on the Coosa and is considered eligible for the National Register because of this construction technique and because it is representative of recognized bridge types (Warren-Pratt combination).



## Central of Georgia Railroad Company bridge at Childersburg

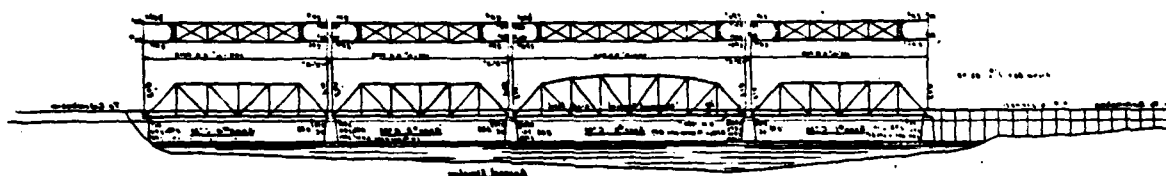


Fig. 35

This pin-connected Pratt thru truss railroad bridge across the Coosa River at Childersburg is owned by the Central of Georgia Railroad Company, a division of Southern Railways. It has a total length of 655 feet and rests upon stone masonry piers. It contains one 200 foot span of a camelback design and three standard truss spans of 149 feet, 6 inches each. An original timber trestle on the west approach has been replaced by a 137 foot span of steel open deck trestle. The bridge was built in 1906 by the Pennsylvania Steel Company, Steelton, Pennsylvania. It appears to be well-maintained.

This bridge has significance because of its early date of construction and because it is pin-connected rather than riveted. The bridge is considered eligible for nomination to the National Register.

## Seaboard Coast Line Railroad north of Childersburg

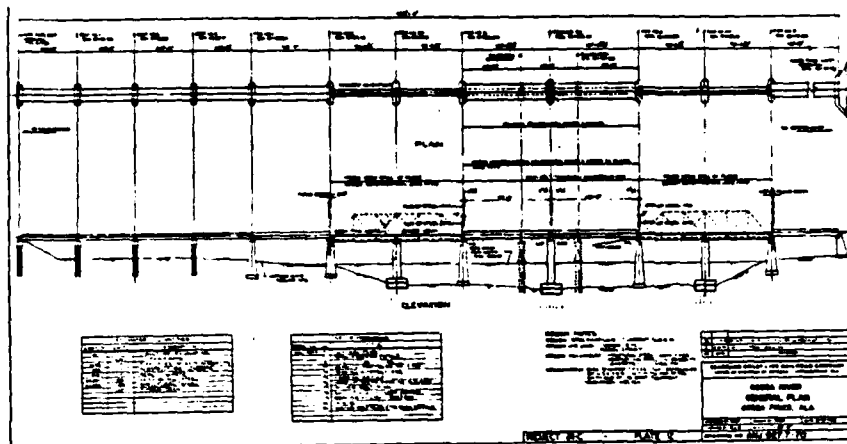


Fig. 36

This bridge has recently undergone considerable reconstruction. Information is not available from the railroad about the original structure, the extent of renovation (although it is substantial from observations on site), who built the original bridge, or any other pertinent historical data. It is mostly a series of open deck pony trusses with two Pratt thru trusses of riveted steel. The total length of the bridge is 932 feet, 11 inches and is supported on concrete piers.

The bridge has no engineering significance and limited historical value because of extensive renovation. Because documentary evidence is unobtainable, it is not recommended that this bridge be considered for nomination to the National Register.

## Southern Railway System bridge east of Pell City

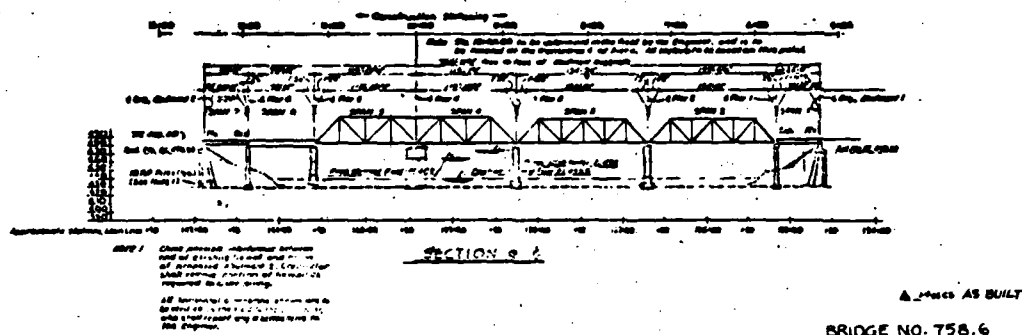


Fig. 37

This important bridge over the Coosa at Riverside, Alabama, is part of the Atlanta to Birmingham route owned by Southern Railways. The crossing consists of a 228 foot Warren thru truss swing assembly, two fixed-pen Warren thru truss spans of 154 and 152 feet respectively. There are additional deck trusses to give a total length of 725 feet, 11 inches. The original girder and truss spans are said to have been built in 1896. The bridge plate on the operable swing span has the Virginia Iron and Steel Company of Roanoke, Virginia, and the date 1927.

This is a significant bridge from an engineering viewpoint. It meets the age criterion for the National Register. It is pin-connected rather than riveted and is an operable swing bridge. In addition, it is adjacent, within a few hundred yards, of the John H. Bankhead Bridge, a historically significant highway crossing. In addition, this is the only Warren thru truss bridge between Martin Dam and Gadsden, Alabama. For these reasons, I recommend that this bridge be considered for nomination to the National Register.

## Seaboard Coast Line Railroad below Neely Henry Dam

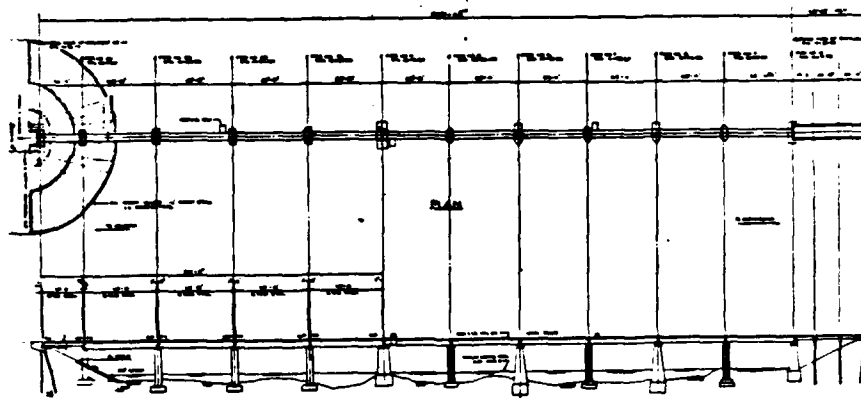


Fig. 38

This bridge, originally built in 1882, has been reconstructed in its entirety between 1974 and 1976. It consists of a series of open deck spans making a total length of 695 feet. The only original work remaining is several of the stone masonry piers. Because information is not available, we have no knowledge about what type of bridge was originally on this site, who constructed it, or any other pertinent data except that it consisted of a truss swing span and fixed truss spans. Not enough information is available to determine eligibility; therefore, it is recommended that this bridge not be considered by the National Register.

## Louisville and Nashville Railroad at Gadsden

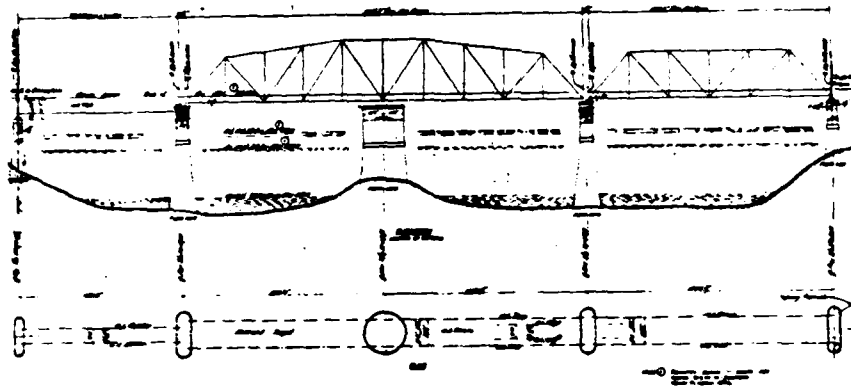


Fig. 39

This important bridge across the Coosa at Gadsden, Alabama, is owned by the Louisville and Nashville Railroad, a division of The Family Lines Rail System and is designated as part of the Alabama Mineral Division, perhaps an indication of its importance as a freight line. The bridge has a total length of approximately 1913 feet, 2 inches. The timber trestle approach on the end nearest Calera, Alabama, (the east) is approximately 1135 feet, 4 inches long. It was originally built in 1911 and rebuilt in 1943. The main spans were constructed in 1909 by the American Bridge Company and consist of a 147 foot, 6 inch Pratt thru truss, a 244 foot, 7 inch Pratt thru truss swing span, and a 98 foot steel deck girder. The timber trestle on the western, or Gadsden approach, is approximately 281 feet, 10 inches long and was originally built in 1911, rebuilt in 1944. No determination has been made on the operability of the swing span.

Data is limited and sketchy, but this is an interesting bridge because of its early construction date and its status as a swing bridge. It has the longest wooden trestle of any bridge across the Coosa from Montgomery

to Gadsden. The fact that it served as both a highway and railroad bridge before construction of the Etowah Memorial Bridge, its long wooden trestle, and its status as a swing bridge make this a significant engineering resource. As such I recommend that it be considered by the National Register.

## SUMMARY

The process of eligibility determination of structures or objects for the National Register of Historic Places is an important and essential step in the management of the nation's cultural resources. The criteria for evaluation are written in a manner that suggests, perhaps encourages, a liberal interpretation of significance. The critical factor revolves around interpretation of significance and recommendations for further mitigation. It is heartening that there is a mechanism through which the nation's cultural resources can be recognized and, in some cases, preserved. It is frustrating because the ultimate determination of which structures and objects should be saved is complicated by the fact that combination of characteristics may mean that certain pristine or representative examples of a building technique or style must be by-passed in favor of one with a combination of characteristics that is more inclusive. A ranking must be established based upon which structure or object has the best combination of traits deemed significant.

Data retrieval for this study has not been overly successful with respect to the railroad companies. It appears there is little interest on their part to support the nomination process. While some of the bridges have been substantially altered, several of these railroad bridges are still largely intact and an estimate of their cultural and engineering value has been determined from on site investigation.

The following bridges are considered eligible for the National Register based primarily upon a) their association with events that have made a significant contribution to the broad patterns of our history (such as the evolution from fixed bridges to swing assemblies that had a broad impact on river navigation across the country), b) that are associated with the life or lives of a person or persons significant in the past, or c) that embody the distinctive characteristics of a type, period or method of construction. They are listed in order of ascending location from Mitchell Dam to Gadsden:

- a) Southern Railway System bridge no. 108-N near Yellow Leaf (south of Childersburg) - important as a late nineteenth century example of a pin-connected metal truss bridge.
- b) the John T. Morgan bridge (U.S. Hwys. 280 and 231 at Childersburg) - important as one of the series of memorial bridges authorized by the Alabama Legislative Act of 1927 that created the Alabama Bridge Corporation.
- c) the Central of Georgia Railroad Company bridge no. P-401.3 at Childersburg - important as a turn of the century, pin-connected metal truss bridge.
- d) the John Hollis Bankhead bridge (U.S. Hwy. 78) at Riverside, Alabama (east of Pell City) - important as a memorial bridge associated with Senator Bankhead who was instrumental in getting a Federal highway system initiated.
- e) the Southern Railway System bridge no. 758.6 at Riverside (east of Pell City) - important as an example of the use of a swing span.
- f) the Gilbert's Ferry Bridge (old Alabama Hwy. 77) south of Gadsden - representative of a swing truss.
- g) Etowah Memorial Bridge (old U.S. Hwys. 278 and 431) at Gadsden - important architecturally and from an engineering stance as representative of a popular building medium (massive reinforced concrete) and as a memorial to World War I veterans.
- h) the Louisville and Nashville bridge no. 149 at Gadsden - important as a swing truss and for its associated wooden trestle.

All of these bridges are representative of a characteristic building type, either Warren or Pratt trusses, or a combination; the Etowah Memorial Bridge which is a concrete arch structure is also representative of a building medium.



### Recommendations for Mitigation

Fully realizing that all of these bridges cannot be equally important, the following recommendations for mitigation are offered. The value of mitigation here is that the opportunity exists to cover a range of types and building techniques. The following bridges are ranked in order of importance as engineering resources on the Coosa River:

- a) the Etowah Memorial Bridge, Gadsden - This bridge is architecturally important and impressive; it is representative of a popular building medium in the United States in the early twentieth century, and it is the most impressive of the memorial bridges that resulted from the 1927 Legislative Act authorizing a series of bridges that would link the state's highway system and be dedicated to important Alabamians. Should this bridge be impacted by future navigation projects on the Coosa, I recommend that it be fully documented historically, that it be documented photographically, and that a full set of scaled drawings be prepared.
- b) the John Hollis Bankhead bridge at Riverside (east of Pell City) - This bridge is important for its association with Senator Bankhead who was influential in establishing a Federally funded highway system. Mitigation should consist of a full historical and photographic documentation.
- c) the Louisville and Nashville bridge no. 149 at Gadsden - This bridge is representative of the use of swing truss assemblies in aiding navigation on American rivers. In addition the bridge is important historically because it served as both a highway, railway and pedestrian crossing of the Coosa until the Etowah Memorial Bridge was constructed in 1927. It also has the longest wooden approach trestle of any bridge on the Coosa between Montgomery and Alabama; most wooden trestles have long since been replaced by concrete approach spans. I recommend that it be mitigated through complete historic and photographic documentation.
- d) the Southern Railway System bridge no. 108-N near Yellow Leaf - This is the oldest pin-connected through truss within the limits of the project area. As such it is representative of a building technique that is no longer employed in bridge construction in the United States. I recommend that the bridge be mitigated by historic documentation and photographic documentation.

In the event that these bridges cannot be mitigated, alternates are proposed here. If the Louisville and Nashville bridge cannot be photographed, then the Southern Railway bridge at Riverside would be an alternate choice for a representative railroad swing span truss. Should the Bankhead bridge not be accessible, then the Gilbert's Ferry Bridge is a near duplicate of the type of construction, including its status as a swing truss bridge. Should the Southern Railway System bridge at Yellow Leaf not be accessible, then the Central of Georgia bridge at Childersburg is also a pin-connected metal truss bridge that would be an acceptable alternate. It cannot be overemphasized that historical documentation of the railroad bridges is contingent upon cooperation from the individual systems. Inability to acquire necessary information may complicate the mitigation process.

PLATES

## Notes to Plates

## Plate I, p. 62

- a) Alabama Highway 22, just south of Mitchell Dam
- b) Southern Railway System Bridge no. 108-N south of Childersburg (near Yellow Leaf) - the oldest pin-connected metal truss bridge between Mitchell Dam and Gadsden.
- c) John T. Morgan Bridge (U.S. Hwy. 280 and 231), Childersburg, Alabama.
- d) Central of Georgia Railroad Company bridge no. P-401.3 at Childersburg, Alabama. One of the oldest pin-connected, metal truss bridges on the upper Coosa.
- e) Seaboard Coast Line Railroad bridge MPANJ-927.7-70 north of Childersburg, Alabama.
- f) Interstate 20 bridge east of Pell City, Alabama.

## Plate II, p. 63

- a) John Hollis Bankhead bridge at Riverside, Alabama.
- b) Southern Railway System bridge no. 758.6 at Riverside, Alabama.
- c) Seaboard Coast Line Railroad bridge no. SG-683.0 below Neely Dam.
- d) Gilbert's Ferry Bridge (Alabama Hwy. 77) south of Gadsden, Alabama.

## Plate III, p. 64

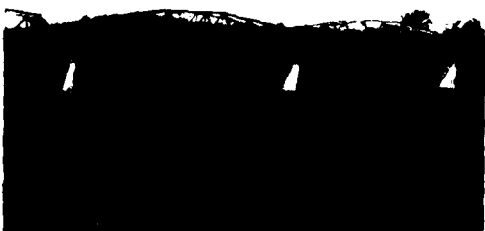
- a) Etowah Memorial Bridge (old U.S. Hwys. 278 and 431), Broad Street, Gadsden.
- b) Louisville and Nashville Railroad Company bridge no. 149 at Gadsden.
- c) Meighan Bridge (new U.S. Hwys. 278 and 431), Gadsden, Alabama.



A



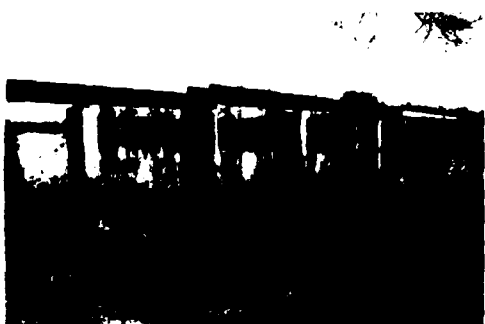
B



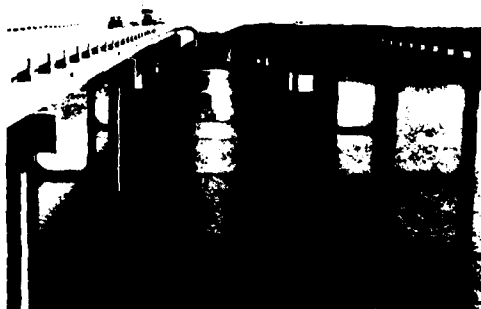
C



D



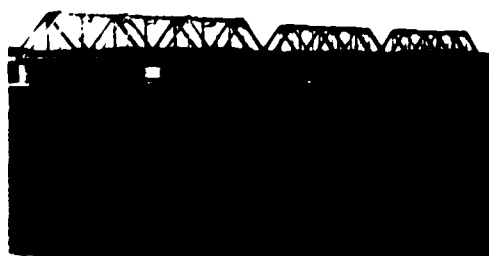
E



F



A



B



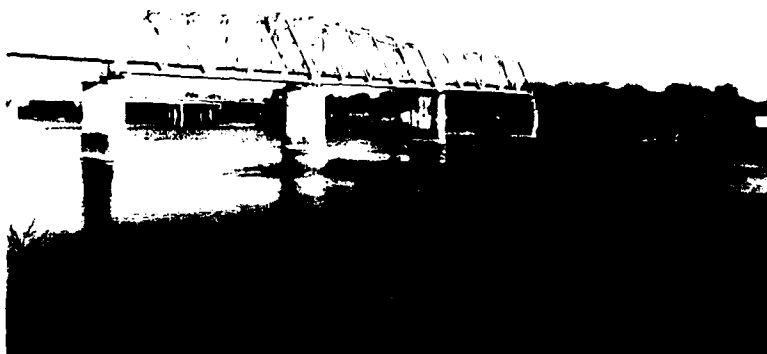
C



D



A



B



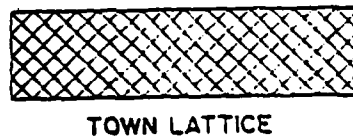
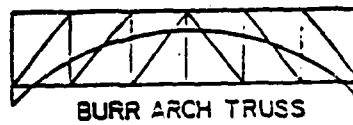
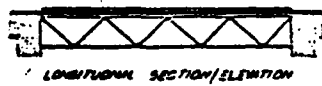
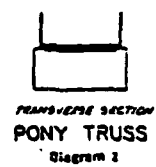
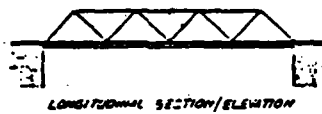
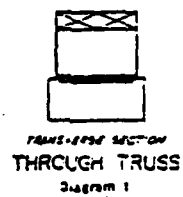
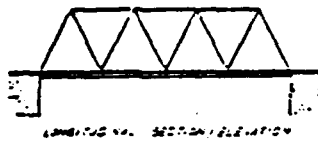
C

## APPENDIX I

### Bridge Truss Types

(taken from Technical Leaflet No. 95, American Association for State and  
Local History, 1977)







HOWE



LENTICULAR (FARRAGUT)



PRATT



BALTIMORE (PETIT)



PRATT HALF-HIP



PENNSYLVANIA (PETIT)



PARKER



KELLOGG



CAMELBACK



DOUBLE INTERSECTION PRATT



WARREN

WARREN  
WITH VERTICALSDOUBLE INTERSECTION WARREN  
LATTICE

BOWSTRING ARCH-TRUSS



FINK



BOLLMAN



STEARNS

APPENDIX II

Bridge Reports

(State of Alabama, Highway Department, Bridge Division, 1968)

# BRIDGE INSPECTION REPORT

DATE Feb. 20, 1968

FORM NO. 3		STATE OF ALABAMA HIGHWAY DEPARTMENT		TRUSS - SLAB - BEAM AND GIRDER BRIDGES				DATE _____	
<b>SUPERSTRUCTURE</b>									
<b>FLOOR CROWN:</b> 2"		<b>SUPERELEVATION:</b>				<b>VERT. CLEAR.</b> Open			
<b>RISER/WALKS:</b>		<b>EPP. JT. MAT'L:</b> 2"				<b>DRAINAGE:</b> 3"			
<b>SPAN NO.</b>	<b>FLOOR DEPTH AND MAT'L</b>	<b>WEAR SURF DEPTH AND MAT'L</b>	<b>CURBS HEIGHT AND MAT'L</b>	<b>TYP</b>	<b>CG</b>	<b>MAT'L IN G</b>	<b>ST</b>	<b>POSTS</b>	<b>CLEARANCE SETS CURBS DEPT. SABS</b>
1-6	6" CONC		11" CONC			Steel	3-2 1/2 Galv		26'-0" 30'-0"
<b>STRINGERS - BEAMS OR GIRDERS:</b>									
<b>SPAN NO.</b>	<b>MAT'L</b>	<b>SPAN &amp; C BEAM</b>	<b>NO OF BEAMS</b>	<b>SPACING</b>	<b>SECTION</b>		<b>TYPE EEP</b>	<b>STD. DWG.</b>	<b>DESIGNATING</b>
					<b>OUTR. STRING</b>	<b>INS. STRING</b>			
1	I beam	58'-6"	5	6'-0"	36W150	36W150	Roll	Special	H 26
2-4	Truss		5	6'-0"	21W 62	21W 60			
5-6	I beam	48'-6"	5	6'-0"	30W120	30W132	Roll	Special	H 2-
<b>TRUSSES:</b>									
<b>WHEN MADE:</b> 1958		<b>FIELD POINT:</b>		<b>PATRICKED BY:</b>					
<b>DESIGN RATING:</b> FLOOR: H 20				<b>TRUSSES:</b> H 20					
<b>SPAN NO.</b>	<b>MAT'L - KIND - TYPE - CONNS.</b>	<b>SPAN C. C. BEAM</b>	<b>NO. AND LOTH OF PANELS</b>	<b>DIST C. C. TRUSSES</b>	<b>DEPTH AT CENTER</b>	<b>TYPE EEP</b>	<b>STD. DWG.</b>		
2-4	Steel Warren Deck Rivet	25'-3 1/2 x 22 1/2	40' 2 1/2 " 121 1/2" 49'-2 1/2 "	20'-0"	47'-0"	Bull Rich. 3rd ed!			

GENERAL												
	SPECS	SATISFACTION				TYPE	CONDITION		WARD RAIL		IS RAIL OFFERED	
		YES	NO	YES	NO		LEFT	RIGHT	AT BRIDGE	50' AWAY	YES	NO
32	ALP 1-1000	X		X		None						
33	ALP 1-1000	X		X		Metal	Fair	Fair	1-5	5		
34	NO RAIL IN PLACE AND UNSATISFACTORY FOR RAILING LISTED ABOVE											

[illegible][illegible][illegible]







FORM 5-10 HIGHWAY DEPARTMENT

DATE 11-19-60

Childersburg

## SUPERSTRUCTURE

FLOOR CROWN 2'		SUPERELEVATION		VERT. CLEAR 15.0 x 12' (18.9)	
NO. WALKS		EXP. JT. MATL. Open to Truss Chords		VERT. CLEAR 3' @ 9.0'	
SPAN NO.	FLOOR DEPTH AND MATL.	WEAR, SURF. DEPTH AND MATL.	CURBS HEIGHT AND MATL.	TYPE	NO.
1-2-3	6 3/4" Conc.	-	10" Conc.	B	2
3-5	6 3/4" Conc.	-	10" Conc.	SH	2

## STRINGERS - BEAMS OR GIRDERS:

SPAN NO.	MATL.	SPAN C.C. BEAMS	NO. OF BEAMS	SPACING	SECTION	TYPE EXP.	STD. GWS.	DESIGN RATING
1-2-3	T Beam	43'-6"	4	5'-10"	30" I.D. 10"	Slide	Special	H15
2-4	T Beam	76'-0"	4	5'-10"	36" I.D.	Slide	Special	H15
3-5	T Beam	180'-0"	4	5'-6"	18" I.D. 8 1/2" x 6 1/2"	Roll	Special	H15

## TRUSSES:

WHEN MADE		YIELD POINT		FABRICATED BY	
DESIGN RATING: FLOOR		TRUSSES			
SPAN NO.	MATL. - KIND - TYPE - CONNS.	SPAN C.C. BEAMS	NO. AND LGTH. OF PANELS	DIST. C.C. TRUSSES	DEPTH AT CENTER
3-5	SH - Warren-Tach-Rivet	180'-0"	8 @ 22.5'	22.5'	31'-0"

106.9 Tons structural Steel Approach

386.5 Tons structural steel Truss

## SUBSTRUCTURE

	MATERIAL	CONDITION	IS THERE ANY							
			SETTLING		SLIDING		PILTING		BULGING	
18. ABUT.	Conc.	Good	YES	NO	YES	NO	YES	NO	YES	NO
19. PIER	Conc.	Good	X		X		X		X	
20. PIERS	Conc.	Good	X		X		X		X	
21. DESCRIBE IN DETAIL ANY UNSATISFACTORY CONDITION LISTED ABOVE			X		X		X		X	

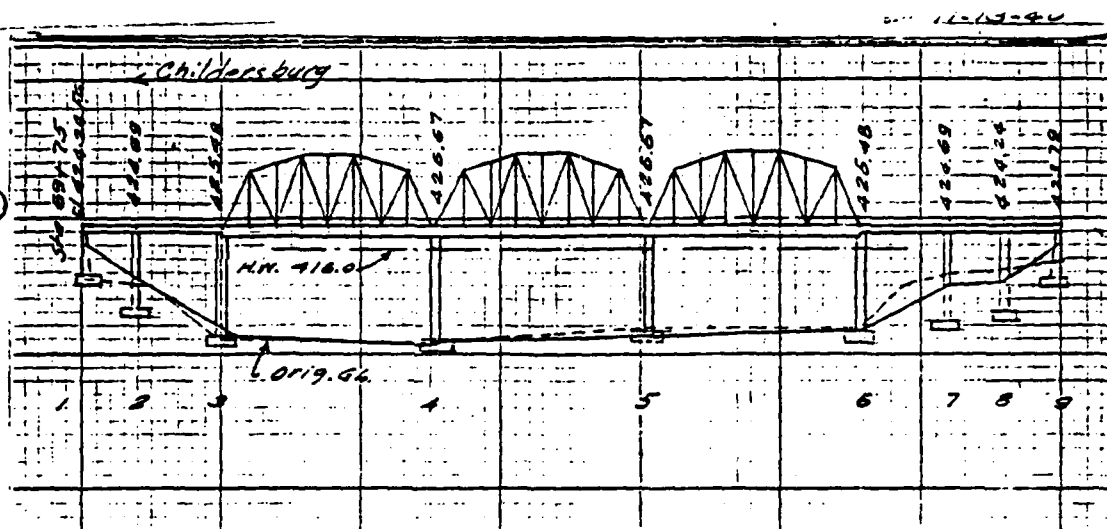
## GENERAL

	SATISFACTORY				TYPE	GUARD RAIL			
	GRADE	YES	NO	SLIGHTLY		CONDITION	DIST. CL. TO FACE RAIL	IS IT	STAYED
22. APPROACH	X			X	N/A	LEFT	RIGHT	AT BRIDGE	30' AWAY
23. APPROACH	X			X	N/A	20' Curb-Curb			
24. CONDITION LISTED ABOVE				X	N/A	21' Handrail-Handrail			

Bridge approaches protected by guard post (timber).

25. APPROACH	Bituminous	WIDTH: 20'	CONDITION: Good
26. DAMAGE STRUCTURE?	No	HOW?	
27. PROTECTED FROM COLLISION?	No	HOW?	
28. CONDITION OF STRAW CHANNEL	Open		
29. IS THERE EVIDENCE OF INADEQUATE OR EXCESSIVE WEARING OR SCOUR?	No	DESCRIBE:	
30. ON ISLANDS, SAND OR GRAVEL BARS	No	CAUSE:	
31. DOES ANYTHING OBSTRUCT OR CAUSE?	No	DESCRIBE:	
32. NO WEEDS, GRASS OR DRIFT	No	DESCRIBE:	
33. OR WEEDS, GRASS OR DRIFT	No	DESCRIBE:	
34. OR WEEDS, GRASS OR DRIFT	No	DESCRIBE:	

SIGNED /s/ A. H. Lipscomb

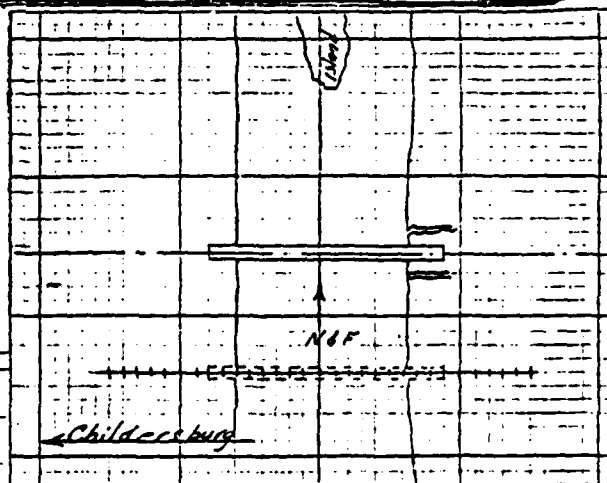


GENERAL		ELEVATION OF STRUCTURE		SCALE 1"=120' 1"=60'	
NAME OF BRIDGE	John T. Morgan	NO. OF SPANS	H15	SPAN	32.0'
OVER STREAM	Coosa River	PAVING	Asph	WIDTH	20.0'
ON HIGHWAY		APPROACH		FAIRLY	500'
WHEN BUILT	1930	PAVING	Asph	FAIRLY	500'
MAINT BY	State	PAVING	Asph	FAIRLY	500'
NO. AND LENGTH OF SPANS	1045' 1078' 30' 100' 1078' 20' 45'	PAVING	Asph	FAIRLY	500'
		PAVING	Asph	FAIRLY	500'

REMARKS: Open as toll bridge until bought by State in 1936



WATERWAY DATA	
DIST LOW	GRADE TO LOW ELEVATION 6' 3" TRESS
AREA	
CHANNEL	
DEPTH	20' 30'
NATURE OF BOTTOM	Gravel
CONDITION OF BANKS	Steep overhanging trees
DESIGN OF PROTECTIVE WORKS	None
DOES ALL FLOOD	Yes
PASS STRUCTURE	Yes



LOCATION SKETCH SCALE 1"=500'



DATE 12-28-54

FLOOR: CROWN: 2 1/2"

### SUPERELEVATION

VERY. CLEAR. 3 PEN

LEFT & RIGHT LANES

### STRINGERS, BEAMS OR GIRDERS:

LEFT & RIGHT EYES

**TRUSSES:**

WHEAT MAZE.

**FIELD POINT.**

FABRICATED BY:

DESIGNATING FLOOR:

TRUSTEES:

SPAN NO.	NATL. - KING - TYPE - CONNS.	SPAN C. C. BEARS.	NO. AND LGTH. OF PANELS	DIST. C. C. TRUSSES	DEPTH AT CENTER	TYPE EXP.	STG. DWS.

## SUBSTRUCTURE

[illegible]

DESCRIBE IN DETAIL ANY UNSATISFACTORY

31. CHAIRMAN, ASSTB

## GENERAL

[illegible]

10-10-1964

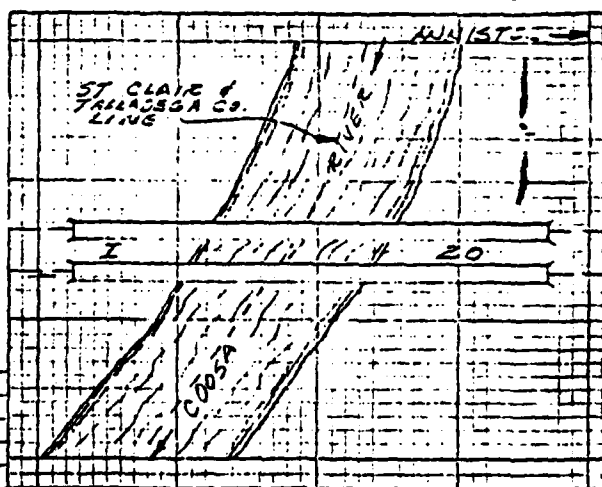
39. CONCLUSION LISTED ABOVE

25	APPROACH	Concrete	WIDTH	CONDITION	Bridge & roadway gradient
26	DOES APPROACH FORMATION	No	ROAD		in the same plane
27	IS STRUCTURE		POST	No clearance or load limit signs	
28	PROTECTED FROM COLLISION?				
29	CONDITION OF STRAUS CHANNEL	Good	Logan	Wartin	Lake Back water
30	IS THERE EVIDENCE OF INADEQUATE			DESCRIBE:	
31	OR PICKUP OPERATIONS ACCOUNT			PROBABLE	
32	DO ISLANDS, SAND OR GRAVEL BARS			CAUSE:	
33	TURN AT ANGLE OR BRIDGE			DESCRIBE:	
34	DO SPILLS, GRASS OR DIRT	No		DESCRIBE:	
35	CARRY PINE PAPER TO BRIDGE	No		DESCRIBE:	
36	HAS DRIVE RECOMMENDED AT	No		DESCRIBE:	

SIGNED [Signature]

[illegible]

**PHOTOGRAPH**



WATERWAY DATA:

WAT. LOW GRADE TO HWY. GRADE TO LOW WATER 11'-9"

DRAINAGE AREA: 7050 sq. m.

WATERWAY CHARACTER AND CONSTANT: 0.3

CHANNEL WIDTH: 40' WITH BANKS

DEPTH OF MAIN OF BOTTOM:

VEGETATION OF BANKS:

DESIGN OF PROTECTIVE WORKING: SLOPE 2:1

SOIL AND FLOOD PROTECTURE: 12 FT. HIGH

REMARKS:

STATE OF ALABAMA  
HIGHWAY DEPARTMENT

BRIDGE INSPECTION REPORT DATE 10-18-68

BRIDGE NUMBER 58-20-7 RIVER Coosa River COUNTY St. Clair STATE HWY NO 1

TYPE OF BRIDGE Approaches Deck Girder alt. Conc. w/alt. Trusses on 3 main Spans.

SUPERSTRUCTURE Trusses on 3 main Spans.

GENERAL CONDITION Truss spans Fair Deck Girder spans poor

1. TYPE AND CONDITION OF FLOOR AREA SURF Concrete floor, Condition Fair

2. IS FLOOR DRAINAGE SUFFICIENT? Yes

3. CURB AND RAILS: Poor

4. DOES THE STRUCTURE VIBRATE OR DEFLECT EXCESSIVELY UNDER LOADS? No

5. ARE THE JOISTS, GIRDERS, BEAMS OR ARCHES IN GOOD LINE? Yes

6. CONDITION OF THE MAIN MEMBERS (TRUSSES, GIRDERS, BEAMS, ARCHES): Bent and distorted, Rusted and Corroded in spots.

7. CONDITION OF FLOOR BEAMS AND CONNECTIONS: Good

8. CONDITION OF JOISTS AND CONNECTIONS: Fair

9. PAINT AND CONDITION OF PAINT WHEN APPLIED? Faint is poor, Do not know when applied.

10. EVIDENCE OF CORROSION OF STEEL? YES

EXPANSION DEVICES & SUPERSTRUCTURE SUPPORTS.

11. ARE THEY FUNCTIONING PROPERLY?

12. DO THEY REQUIRE

13. IS PROPER EXPANSION SPACE PROVIDED

14. DESCRIBE IN DETAIL ANY UNSATISFACTORY CONDITIONS LISTED ABOVE: Concrete on main piers is disintegrating spalls cracks - disintegration is evident on caps, girders handrails, floor and posts on deck - war

15. HAS STRUCTURE BEEN DAMAGED BY COLLISION, OVERLOADING OR OTHER CAUSE? Yes

16. DESCRIBE: Numerous oversize loads have damaged various members of Truss spans, Collisions have damaged the post and rails on the approach spans

17. HAS THE SUPERSTRUCTURE MOVED TRANSVERSELY? Truss spans No

18. DESCRIBE: Deck Girder Yes, End of some spans misalign

SUBSTRUCTURE

SENT NO.	TYPE AND MATL.	HT. GRADE TO TOP CAP	HT. TOP CAP TO BOTT. FOOT.	NO. AND LGTH. PILES	FOUNDATION MATL.	DIST. GRADE TO GROUND
1	2' x 2' x 2' concrete	3'-2 1/2"				
2	2' x 2' x 2' concrete	3'-2 1/2"				
3	2' x 2' x 2' concrete	3'-2 1/2"				
4	2' x 2' x 2' concrete	3'-2 1/2"				
5	2' x 2' x 2' concrete	3'-2 1/2"				
6	2' x 2' x 2' concrete	3'-2 1/2"				
7	2' x 2' x 2' concrete	3'-2 1/2"				
8	2' x 2' x 2' concrete	3'-2 1/2"				
9	2' x 2' x 2' concrete	3'-2 1/2"				
10	2' x 2' x 2' concrete	3'-2 1/2"				
11	2' x 2' x 2' concrete	3'-2 1/2"				
12	2' x 2' x 2' concrete	3'-2 1/2"				
13	2' x 2' x 2' concrete	3'-2 1/2"				
14	2' x 2' x 2' concrete	3'-2 1/2"				
15	2' x 2' x 2' concrete	3'-2 1/2"				
16	2' x 2' x 2' concrete	3'-2 1/2"				

STRENGTH ROADWAY ELEVATION

58-20-7 St. Clair FAS 73 A 5C-4 ARE 1275 SCCE TRUSS

FORM 81-C  
STATE OF ALABAMA  
HIGHWAY DEPARTMENT

THRU - SLAB - BEAM AND GIRDER BRIDGES

DATE 1-19-71

## SUPERSTRUCTURE

FLOOR: CROWN		SUPERELEVATION		VERT. CLEAR.	
				15' 8 1/2" 3.8'	
SLOTTABLES		EXP. JT. MATL.		BRAINS	
				2"	
SPAN NO.	FLOOR DEPTH AND MATL.	WEAR SURF DEPTH AND MATL.	CURBS HEIGHT AND MATL.	TYPE	NO.
1-5 & 10-16	6" CONC.	~	10" CONC.	F	1
6-9	7" CONC.	~	10" CONC.	F	1
				RAILINGS	
				2' 4" CONC.	
				CUTS	
				19' 8" 1' 2"	
				CUTS	
				19' 5" 1' 2"	

## STRINGERS - BEAMS OR GIRDERS:

SPAN NO.	MATL.	SPAN C.C. BEARS	NO. OF BEAMS	SPACING	SECTION	TYPE EXP.	STD. DWG.	DESIGN RATING
1-5 & 10-16	SLAB	34'	4	5'-10"	16 1/2" x 24" 16 1/2" x 24"	SLAB	SE	5-84

## TRUSSES:

WHEN MADE: 1929		FIELD POINT:		FABRICATED BY: Vincennes Bridge Co.	
DESIGN RATING: FLOOR: H-15		TRUSSES: H-15			
SPAN NO.	MATL. - KIND - TYPE - CORR.	SPAN C.C. BEARS	NO. AND LTH. OF PANELS	DIST. C.C. TRUSSES	DEPTH AT CENTER
1-5 & 10-16	Steel - Heavy - Rivet - Bridge	230'	20 - 20'	20 - 20'	20 - 20'
6-9	" " " " " "	230'	20 - 20'	20 - 20'	20 - 20'

4.5' x 10' Top Decking Plan

## SUBSTRUCTURE

	MATERIAL	CONDITION	SETTLING		SLIDING		TILTING		BULGING		UNDERMINING		CRACKING	
			YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
10. ABUT.	Conc.	Fair		X		X		X		X		X		X
15. ABUT.	Conc.	Fair		X		X		X		X		X		X
20. PIERS														

DESCRIPTION IN DETAIL AND UNSATISFACTORY

21. CONDITION LISTED ABOVE cracking and spalling

## GENERAL

	SATISFACTORY		TYPE	CONDITION		GRADE		IS IT A GOOD	
	CRACK	ALIGNMENT		LEFT	RIGHT	AT BRIDGE	SO AWAY		
20. APPROACH	X		Conc. Asphalt	Good	Good	None	None	X	
22. APPROACH	X		" "	Good	Good	None	None	X	

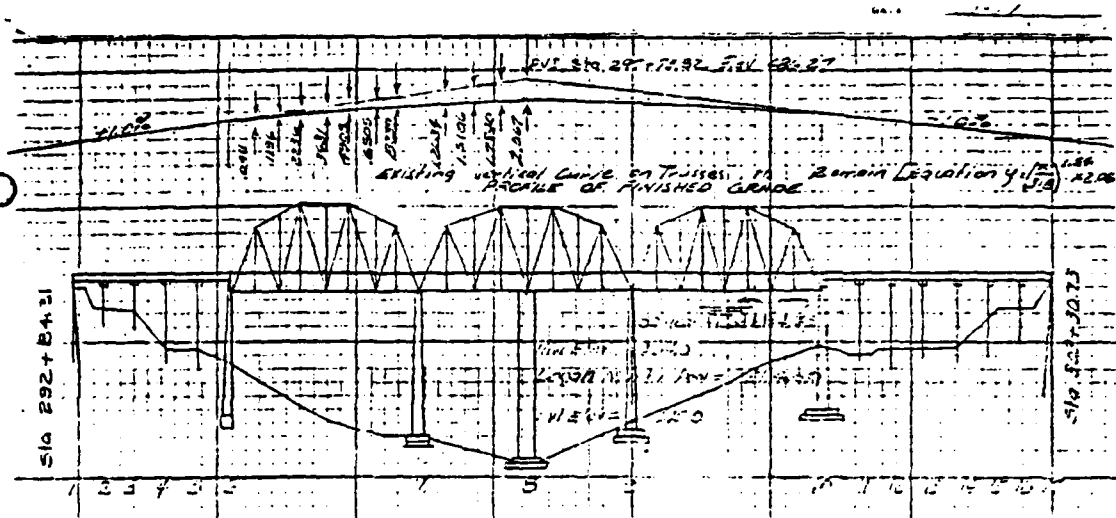
DESCRIPTION IN DETAIL AND UNSATISFACTORY

24. CONDITION LISTED ABOVE

20. APPROACH	Concrete under asphalt	24	CONDITION	Good
21. DOES ANYTHING PROHIBIT				
22. IS STRUCTURE	NO			
23. PROTECTION FROM COLLISION	NO			
24. CONDITION OF STRAP CHANNEL				
25. AT APPROX. 100' FROM BRIDGE	Backwater from Logan Martin dam.			
26. IS THERE EVIDENCE OF INADEQUATE				
27. DO EXCESS DEPOSITS OR GRAVEL HARS				
28. FORM AT APPROX. 100' FROM BRIDGE				
29. DO EXCESS DEPOSITS OR GRAVEL HARS				
30. FORM AT APPROX. 100' FROM BRIDGE				
31. DO EXCESS DEPOSITS OR GRAVEL HARS				
32. FORM AT APPROX. 100' FROM BRIDGE				
33. DO EXCESS DEPOSITS OR GRAVEL HARS				
34. FORM AT APPROX. 100' FROM BRIDGE				

123

SIGNED



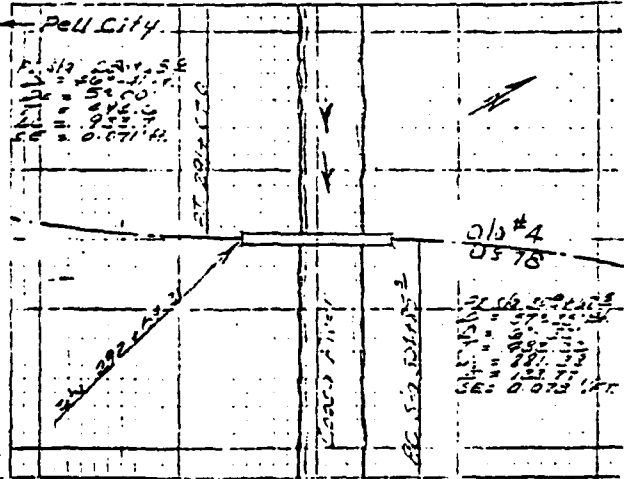
John H Bankhead  
Coosa River State  
1930-72  
State  
5,234.0, 12,220, 12,232, 12,200  
7.2 34.0

ELEVATION OF STRUCTURE  
SCALE 1"=15' 1"=50'

CONC.  
20'-0" 32'-0"

Bridge raised & new approach spans built. Project No. 127 (rd) 1971

PHOTOGRAPH



LOCATION SKETCH

SCALE 1"=1000'



FORM BI-4

STATE OF ALABAMA  
HIGHWAY DEPARTMENT

## BRIDGE INSPECTION REPORT

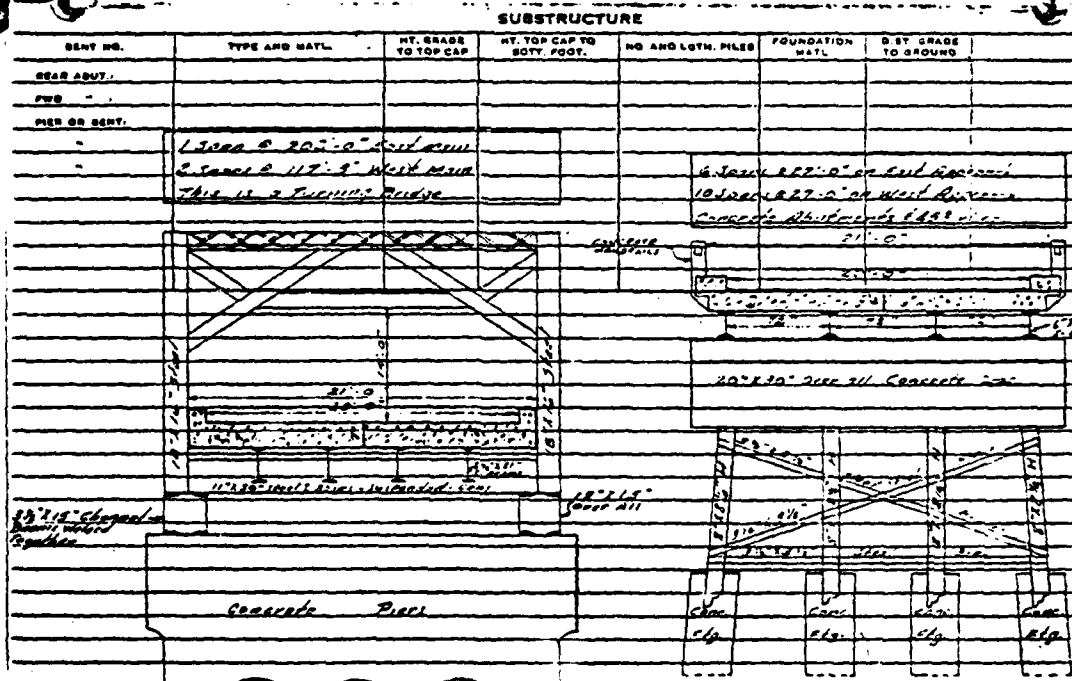
DATE 7-23-60

BRIDGE NO. 77-28-7.4 Coosa River - So. Side COUNTY Etowah STATE HWY NO. 22-77  
 OVER STREET Coosa River TYPE OF SPANS 16 Spans 18" I Beam ROADWAY 20'  
 SUPERSTRUCTURE 2-Spans O.H. Steel

1. GENERAL CONDITION Good - Except as noted on attached sheet.  
 2. FLOOR IN CONDITION OF FLOOR & WEAR SURF Good  
 3. IS FLOOR DRAINAGE SUFFICIENT? Yes  
 4. CURBS & RAILS Good - Except Spans 14 & 15  
 5. DOES THE STRUCTURE VIBRATE OR DEFLECT EXCESSIVELY UNDER LOADS? Yes  
 6. ARE THE TRUSSES, GIRDERS, SPANS OR ARCHES IN GOOD LINE? Yes  
 7. CONDITION OF THE MAIN MEMBERS (TRUSSES, GIRDERS, SPANS, ARCHES) Good  
 8. CONDITION OF FLOOR BEAMS AND CONNECTIONS  
 9. CONDITIONS OF JOISTS AND CONNECTIONS  
 10. CONDITION OF PAINT WHEN APPLIED: Red Lead & Aluminum - Br. is now being painted under contract.  
 11. WEARS OR PARTS OF WEARS? Yes  
 12. EXPANSION DEVICES & SUPERSTRUCTURE SUPPORTS.  
 13. ARE THEY FUNCTIONING PROPERLY? YES NO YES NO YES NO YES NO YES NO YES NO YES NO YES NO  
 14. DO THEY REQUIRE REPAIR? YES NO YES NO YES NO YES NO YES NO YES NO YES NO YES NO YES NO  
 15. IS PROPER EXPANSION SPACE PROVIDED? YES NO YES NO YES NO YES NO YES NO YES NO YES NO YES NO YES NO  
 16. DESCRIBE IN DETAIL ANY UNSATISFACTORY CONDITIONS LISTED ABOVE? Good except cap Bent No. 14. See attached sketch.

18. HAS STRUCTURE BEEN DAMAGED BY COLLISION, OVERLOADING OR OTHER CAUSE? Yes DESCRIBE DAMAGE See Item No. 4 above

17. HAS THE SUPERSTRUCTURE MOVED TRANSVERSELY? No DESCRIBE



BRIDGE NO.	COUNTY	FEED. ST.	U.S. HWY.	PROJECT NO.	TYPE	STRENGTH	ROADWAY	CLEARANCE
77-28-7.4	ETOWAH				CIRCULAR PIER			

AD-A103 372

AUBURN UNIV AL DEPT OF GEOGRAPHY

INVENTORY AND EVALUATION OF ENGINEERING CULTURAL RESOURCES: MON--ETC(U)

MAR 81 G JEANE

DACW01-80-M-8887

F/6 3/1

NL

UNCLASSIFIED

2 OF 2

ADA  
103372



END  
DATE  
FILMED  
10-81  
DTIC

FORM 84-1 HIGHWAY DEPARTMENT TRUSS - PLAN - PLAN AND GROUND ELEVATIONS DATE

## SUPERSTRUCTURE

FLOOR: DOWN: SUPERELEVATION: VERT. CLEAR: 15'-0"

EXP. JT. MATL. DRAINAGE: CLEARANCE

SPAN NO.	FLOOR DEPTH AND MATL.	WEAR SURF DEPTH AND MATL.	CURBS HEIGHT AND MATL.	TYPE	NO.	DATE	AT	BY	DATE	BY	DATE	BY
1-6/10-12	2" CONC.		CONC.		1	1960						
7-9	2" CONC.		CONC.									

## STRINGERS - BEAMS OR GIRDERS:

SPAN NO.	MATL.	SPAN C. C. BEAMS	NO. OF BEAMS	SPACING	SECTION	TYPE EXP.	STD. BWS	COMB. RATING
1-6/10-12	2" Beam		1	6'-0"	2" X 12" 2" X 12"			2
7-9	2" Beam							

## TRUSSES:

WHEN MADE: YIELD POINT: FABRICATED BY:

DESIGN RATING: FLOOR: TRUSSES:

SPAN NO.	MATL. - KIND - TYPE - CONNS.	SPAN C. C. BEAMS	NO. AND LGTH. OF PANELS	DIST. C. C. TRUSSES	DEPTH AT CENTER	TYPE EXP.	STD. BWS
7-9	Through Steel Truss	1					

## SUBSTRUCTURE

	MATERIAL	CONDITION	IS THERE ANY												
			SLIPING		SLIDING		TILTING		BUILDING		UNDERMINING		TOTAL		
			YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		YES	NO
18. NEAR ABUT.	Conc.	Fair		X		X		X		X		X		X	
19. ABUT.	Conc.	Fair		X		X		X		X		X		X	
20. PIERS	Steel & Conc.	Fair		X		X		X		X		X		X	
21. DESCRIBE IN DETAIL ANY UNSATISFACTORY CONDITION LISTED ABOVE:															

## GENERAL

	SATISFACTORY		ALIGNMENT		TYPE	CONDITION		GUARD RAIL		DIST. CL. TO FACE MATL.	IS	GOOD
	YES	NO	YES	NO		LEFT	RIGHT	AT BRIDGE	50' AWAY			
22. NEAR APPROACH	X		X		Steel	Good	Good	20'	28'			X
23. APPROACH	X		X		Steel	H	H	20'	28'			X
24. DESCRIBE IN DETAIL ANY UNSATISFACTORY CONDITION LISTED ABOVE:												

25. APPROACH	PAV. TYPE Asphalt Plant Mix	WIDTH 22'	CONDITION Good
26. ROAD PAVEMENT	NO	NO	
27. IS STRUCTURE PROTECTED FROM COLLISION?	Yes	NO	Guardrails
28. CONDITION OF STREAM CHANNEL	Good		
29. AT ABOVE AND BELOW BRIDGE:			
30. IS THERE EVIDENCE OF INADEQUATE OR EXCESS DEPTH OR SCOUR?	No	DESCRIBE:	
31. DO ISLANDS, SAND OR GRAVEL BARS FORM AT ABOVE OR BELOW BRIDGE?	No	PROBABLE CAUSE:	
32. DO PILES OR OTHER OBSTACLES EXIST AT ABOVE OR BELOW BRIDGE?	No	DESCRIBE:	
33. DO WEEDS, GRASS OR DRIFT CAUSE FIRE HAZARD TO BRIDGE?	No	DESCRIBE:	
34. IS THERE EXCESSIVE AT OR NEAR BRIDGE?	No	DESCRIBE:	

SIGNED Shirley Lambert A.C.





## SUPERSTRUCTURE

FLOOR: CROWN 2"		SUPERELEVATION		VERT. CLEAR: open	
SIDEWALKS 2@3.2'		SIP JV MATL Bit.		GRAVE: Deep inlets - 10' to 12'	
SPAN NO.	FLOOR DEPTH AND MATL.	WEAR SURF DEPTH AND MATL.	CURBS HEIGHT AND MATL.	TYPE NO.	RAILROAD NO.
1-12	8" conc.	1" 2" Bit.	10" conc.	C	spindle conc. 3'-5' conc. 27'-0" 31'-0"

## STRINGERS, BEAMS OR GIRDERS

SPAN NO.	MATL.	SPAN C. C. BEAMS	NO. OF BEAMS	SPACING	SECTION OUTSIDE BEAMS INSIDE BEAMS	TYPE SIP	STD. CWS	DESIGN RAT.

## ARCHES OR FRAMES DESIGN RATING

ARCHES OR FRAMES DESIGN RATING

EXPANDED

DEPTH REL. AT CROWN

SHAPE	EXPANSION							
SPAN NO.	MATL. AND TYPE	NO. AND SPEC. R.R.B.	CLEAR SPAN	RISE	NO. AND LGTH. PANELS	W. 3TH R.R.B.	CROWN THICKNESS	PIERS TH. AND NO.
1	open standard	2@22.0'	162.24'	22.67'		5'-0"	1'-6"	2.48
2	conc.	"	66.42'	2'-5"		"	"	2-2
3	"	"	74.47'	28.5'		"	1'-7"	2.66
4	"	"	83.47'	31'-10"		"	1'-8"	2.32
5	"	"	92.47'	35'-6"		"	1'-8"	3.21
6	"	"	104.47'	39'-7"		"	1'-11"	3-4
7	"	"	116.21'	42'-2"		"	2'-1"	3-7 1/2
8	"	2@31'-6"	136.96'	49'-5"		3'-6"	2'-4"	4-1
9	"	"	150.95'	53'-3"		"	2'-6"	4-3 1/2
10	"	"	135.96'	49'-5"		"	2'-4"	4-1
11	"	"	126.21'	49'-6"		"	2'-2"	3-9 1/2
12	"	2@22'-0"	99.23'	49'-10"		5'-0"	2'-0"	2-1
PIERS OR BENT								
2	solid conc.					"	32.0'	
3	"					"	34.0'	
4	"					"	42.0'	
5	"					"	43.0'	
6	"					"	40.0'	
7	"					"	44.0'	
8	"					"	54.0'	
9	"					"	82'-8 1/2'	
10	"					"	85'-8 1/2'	
11	"					"	70.0'	
12	"					"	49.0'	

At Coosa River Bridge at Gadsden on US-241 low point  
 1500' East of river bridge is 32.2' above zero on river gauge. However,  
 when the river reaches 20.0' on the gauge it is at rule on old US-11  
 or Ala. 28 one mile South of Gadsden.

BRIDGE NO.	COUNTY	RD. NO.	US HWY.	PROJECT NO.	TYPE	STRENGTH	ROADWAY	CLEARANCE
2832	Etowah	2	431	S-42	RC Arch			

## SUPERSTRUCTURE

FLOOR: CROWN <u>2"</u>		SUPERELEVATION <u>---</u>		VERT. CLEAR <u>open</u>	
SIDEWALKS <u>203.7'</u>		EXP. JT. MATL. <u>Bit.</u>		GRAVING <u>Deep inlets - 10'-2"</u>	
SPAN NO.	FLOOR DEPTH AND MATL.	WEAR SURF DEPTH AND MATL.	CURBS HEIGHT AND MATL.	TYPE NO.	RAILING NO.
<u>1-12</u>	<u>8" conc.</u>	<u>1"-2" Bit.</u>	<u>10" conc.</u>	<u>C</u>	<u>spike conc. 3'-0" conc.</u>
					VERT. CLEARANCE <u>27'-0" 34'</u>

## STRINGERS - BEAMS OR GIRDERS

SPAN NO.	MATL.	SPAN C C BEAMS	NO. OF BEAMS	SPACING	SECTION	TYPE EXP.	STD. DIM.	DEPTH

## ARCHES OR FRAMES, DESIGN RATING

SHAPE	MATL. AND TYPE	NO. AND SPEC. RIBS	CLEAR SPAN	RISE	NO. AND LGTH. PANELS	WIDTH RIBS	CROWN THICKNESS	SPAN
<u>1</u>	<u>open standard</u>	<u>2 R22.0'</u>	<u>162.24'</u>	<u>22.67'</u>		<u>5'-0"</u>	<u>11'-6"</u>	<u>24</u>

## SUBSTRUCTURE

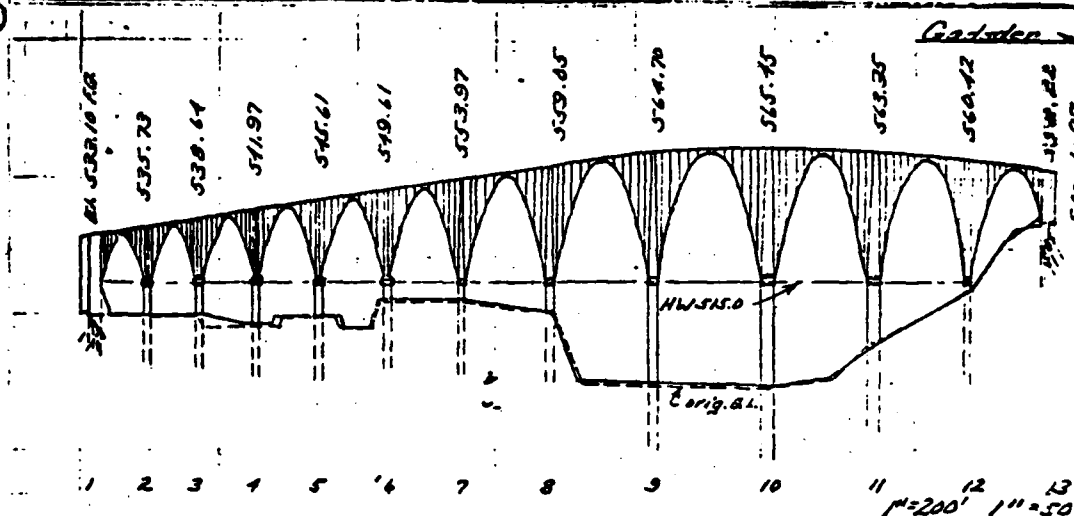
BENT NO.	TYPE AND MATL.	HT. GRADE TO TOP CAP	HT. TOP CAP TO BOTE FOOT	NO. AND LGTH. PILES	FOUNDATION MATL.	0.5' GRADE TO 3.0' UND.
BEAR ABUT. <u>1</u>	<u>Box cone.</u>				<u>clay mat</u>	<u>26.0'</u>
PUR <u>13</u>	<u>"</u>				<u>"</u>	<u>18.0'</u>
PIER OR BENT <u>2</u>	<u>Solid cone.</u>				<u>"</u>	<u>32.0'</u>
<u>3</u>	<u>"</u>				<u>"</u>	<u>34.0'</u>
<u>4</u>	<u>"</u>				<u>"</u>	<u>42.0'</u>
<u>5</u>	<u>"</u>				<u>"</u>	<u>43.0'</u>
<u>6</u>	<u>"</u>				<u>"</u>	<u>40.0'</u>
<u>7</u>	<u>"</u>				<u>"</u>	<u>44.0'</u>
<u>8</u>	<u>"</u>				<u>"</u>	<u>54.0'</u>
<u>9</u>	<u>"</u>				<u>"</u>	<u>82.06'</u>
<u>10</u>	<u>"</u>				<u>"</u>	<u>85.89'</u>
<u>11</u>	<u>"</u>				<u>"</u>	<u>70.0'</u>
<u>12</u>	<u>"</u>				<u>"</u>	<u>19.0'</u>

At Coosa River Bridge at Gadsden on US-241 low point  
 1500' East of river bridge is 32.2' above zero on river gauge. However,  
 when the river reaches 24.0' on the gauge it is at grade on old US-11  
 or Ala. 23 one mile South of Gadsden.

FORM 2-6 STATE OF ALABAMA  
HIGHWAY DEPARTMENT

ARCH OR FRAME BRIDGES

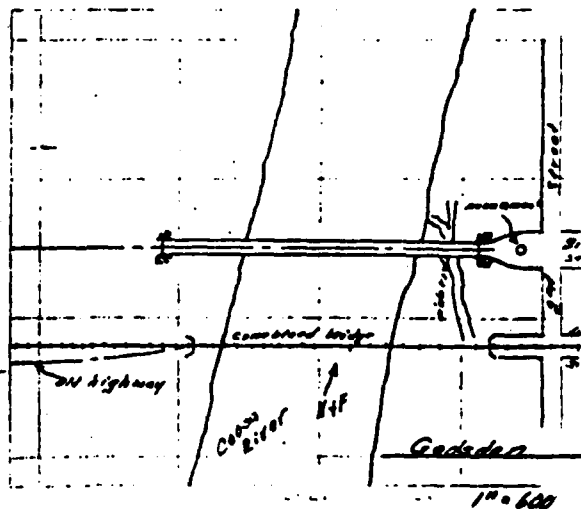
DATE 1-8-41



Coosa River  
1927  
State (C.G. Kershaw Const. Co.)  
Concrete  
28.0'  
500'  
5399, 640.30

State  
135-0'  
1039'-10126'-10136'-10151'-10136'  
10116'-10118'-1022'-1028'-1074'-1066'-1062'

40.0'  
580'±



PATERSON DATA

DATE 1-8-41

BY 101

CHECKED BY 101

APPROVED BY 101

REVISIONS

REVISIONS

REVISIONS

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60M 6-4 STATE OF ALABAMA  
HIGHWAY DEPARTMENT

TRUSS - SLAB - BEAM AND GIRDER BRIDGES

DATE 2-8-55

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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## SUPERSTRUCTURE

FLOOR CROWN		SUPERELEVATION		VERT. CLEAR.	
20' 6'-0"				Open	
SPAN NO.	FLOOR DEPTH AND MATL.	WEAR SURF DEPTH AND MATL.	CURB HEIGHT AND MATL.	RAILINGS	CLEARANCES
19	6" Conc		11" Conc	1 Steel 3-1/2" Conc	20' 26' 6'-0"

## TRUSSERS - BEAMS OR GIRDERS

SPAN NO.	MATL.	C. C. BEAMS	NO OF BEAMS	SPACING	SECTION		TYPE EXP.	STD. D.W.	DESIGN RATING
					OUTR. STRING	INS. STRING			
14-15	RC DG	32'-6"	10	6'-3"	16"x33"	16"x33"	16H	Special	H22-16
13	R Gdr	20' 9 1/2"	4	25'-0"	16"x84"	16"x84"	16H	Special	H22-16
11-12	R Gdr	130' 1/2" 130'	4	25'-0"	9 1/2"x108"	9 1/2"x108"	16H	Special	H22-16

Note: R Gdr. Spans have 6 stringers 24" WF 87#

TRUSSES		FIELD POINTS		FABRICATED BY	
DESIGN RATING: FLOOR		TRUSSES		DESIGN RATING: FLOOR	
SPAN NO.	MATL. - KIND - TYPE - CONDS.	SPAN C. C. BEAMS	NO AND LGTH. OF PANELS	DIST. G. C. TRUSSES	DEPTH AT CENTER

## SUBSTRUCTURE

	MATERIAL	CONDITION	SETTLING		SLIDING		TILTING		BULGING		UNDERMINING		IS THERE ANY
			YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	
10. BEAR	Conc.	Good	X		X		X		X		X		
12. ABUT.	"	"	X		X		X		X		X		
20. PIERS	"	"	X		X		X		X		X		

 DESCRIBE IN DETAIL ANY UNSATISFACTORY  
CONDITION LISTED ABOVE

## GENERAL

	SATISFACTORY		ALIGNMENT		TYPE	CONDITION		GUARD RAIL		IS RAIL. SLOPED
	YES	NO	YES	NO		LEFT	RIGHT	AT BRIDGE	AWAY	
22. BEAR	X		X		None					X
22. APPROACH	X		X		None					X

 DESCRIBE IN DETAIL ANY UNSATISFACTORY  
CONDITION LISTED ABOVE

25. APPROACH	Conc.	WIDTH	34'	CONDITION	Good
26. OVER PASSAGE	Conc.	NO	NO		
27. PROTECTED FROM COLLISION	No	NO			
28. CONDITION OF APPROACH	Good				
29. IS THERE EVIDENCE OF INADEQUATE	No				
30. DO ISLANDS, CREEKS OR TRAIL DAMS	No	DESCRIBE:			
31. DO ISLANDS, CREEKS OR TRAIL DAMS	No	CAUSE:			
32. DO ISLANDS, CREEKS OR TRAIL DAMS	No	DESCRIBE:			
33. DO ISLANDS, CREEKS OR TRAIL DAMS	No	DESCRIBE:			
34. DO ISLANDS, CREEKS OR TRAIL DAMS	No	DESCRIBE:			

SIGNED Shirley Lambert



### APPENDIX III

#### Recommendations for Analyzing and Interpreting Engineering Resources

### Appendix III

#### Recommendations for Analyzing and Interpreting Engineering Resources

A considerable amount of preliminary work goes into making a decision about whether a specific resource, cultural or engineering, is suitable for eligibility for nomination to the National Register of Historic Places. The guidelines are general, often vague, and place an added burden of determination upon a sponsoring agency that may be physically removed a vast distance from the site or structure. An effort on the part of the field investigator to be selective in terms of the resources submitted for consideration has the potential for saving time and tax dollars. Since it is misleading to assume, as existing guidelines imply, that most anything over fifty (50) years is eligible for nomination to the National Register, the following represents a suggested procedure for evaluating whether a site or structure should even be submitted to a nominating agency, or, if it should receive more than minimal documentation. The focus here is, obviously, bridges, but any cultural resource could be substituted and the specifics modified accordingly. The following suggestions are in addition to, not a substitute for, existing guidelines and government regulations.

The initial phase of investigation is to become familiar with the existing data bases. An investigator should contact some or all of the following kinds of agencies to determine the amount and kinds of data they have available for public use:

- a. the State Historic Preservation Officer
- b. the State Archivist
- c. pertinent bureaus of the State Highway Department
- d. state and local planning commissions
- e. state and local historical societies
- f. knowledgeable individuals and professionals in the subject field

The Preservation Officer can advise what types of similar surveys or reports are in progress, or that have been completed. In addition, valuable contacts may surface as a result of conversation with the Historic Preservation officer. The archivist will be helpful in locating the whereabouts of

historical documents that will eventually be important should nomination forms become essential. Planning commissions often have specialized data, but it can prove useful, particularly in urban areas where bridges and general transportation flow are periodically analyzed. Large amounts of useful data can be obtained from the bridge bureau of the state highway department. A drawback is that this voluminous material is not always organized in a manner that makes information easily retrievable.

After initial contact with agencies and individuals, investigators can then commence fieldwork. The bridge site is the first item to analyze. Site refers to the actual location of the bridge. One should attempt to find out if the site is original. Is there any evidence of a shift in the bridge? Old pilings? Perhaps a new bridge just above or below an abandoned one? Also, an attempt to determine historical perspective should be initiated. Was the site formerly a ford? What about ferry operations?

Following assesment of the site, the bridge situation should be reviewed. This refers to the relationship of the bridge site in the overall transportation scheme. Is it associated with a historic route? Was a new route created for the present structure? Major alterations to an existing route? Any connection with a regional or national network design?

Bridge function is another item of review. Is it rail, road, or a combination of the two? How has it been modified since construction? Was it intended for local use only, or to be part of a broader transportation scheme? Was the bridge designed for commercial use or for passengers?

Once the site, situation and function have been assessed, the process of reconstructing the history of the bridge becomes more meaningful. Reconstructing the history includes not only the date(s) of construction, but the manufacturer (if prefabricated), the engineer in charge, association of the bridge with important people and events, and its role in the local and regional economy.

Lastly, the technical aspects have to be considered. The following is a representative list of the more cogent features to be looked at:

- a. total length of bridge
- b. length of individual spans
- c. number of spans and material of construction
- d. number of piers and materials of construction
- e. feature spanned (river, gorge, valley)
- f. width of the road or guage of the track
- g. height of the bridge above water

- h. abutments and material of construction
- i. type of truss, arch, etc.
- j. height of the bridge
- k. depth of pier and abutment construction

This suggested procedure does not represent a fool-proof system.

Once this amount of data has been accumulated though, the investigator has enough material to evaluate the site and/or structure and make an intelligent recommendation to the proper authority about the value of the resource. A prevalent problem with all the agencies which must deal with evaluating our nation's cultural resources is the heavy backlog of applications, many of which should possibly never have been submitted. Perhaps this procedure, in association with existing guidelines, will alleviate some of the unnecessary pressure and facilitate the processing of valuable cultural/engineering resources.

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## GLOSSARY

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Abutment - the part of a buttress, pier, or wall which receives the thrust of an arch, vault, strut, bridge or dam.

Aqueduct - a structure above or below ground used for the conveyance of water.

Caisson - a box or chamber used for construction under water.

Cantilever - a projecting beam supported only at one end, also the two beams or trusses projecting from piers toward each other which when joined form a span of a cantilever bridge.

Coffer - in building ornamented panel deeply recessed in a vault or dome chiefly to lighten the structure.

Cofferdam - a watertight enclosure made of piles packed with clay and from which the water has been pumped out to expose the bottom of a river, also temporary dam across a river.

Continuous beam - a girder or beam having more than two supports.

Girder - a horizontal main structural member that supports vertical loads, often of several pieces and can be of more than one material.

Joist - any small rectangular timber or rolled steel beam directly supporting a floor.

Pozzolana or Pozzuolana - a loosely compacted siliceous rock of volcanic origin, a mortar used in Roman building made with pozzolana.

Span - the spread or extent of a bridge between abutments or supports.

Trestle - a braced framework of timbers, piles, or steelwork for carrying a road or railroad over a depression.

Truss - an assemblage of wooden or iron members forming a rigid framework.

Voissure - wedge-shaped stones used in Roman arches.



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